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ABSTRACT

The purpose of the study was to develop a methodology of collecting data pertaining to the dental tasks taught and the responsibility levels to which they are taught in the curricula of educational institutions preparing dental assistants, hygienists, and laboratory technicians. The sample group consisted of Faculty and Preceptor respondents from dental auxiliary programs in sixteen accredited institutions of higher education in a midwestern State. They were asked to respond to a Dental Task Inventory of 625 dental task assignments to identify the level of responsibility to which they taught the task and the cumulative time spent teaching each task. The responses were keypunched and respondents' reliability determined by analyzing paired statement response. Faculty respondents had a high level of response stability but had difficulty deciding whether or not they taught a task. The Preceptors showed less response stability, knew whether or not they taught a task, but were unsure at which level they taught the task. No reliable responses were obtained to the question of time spent teaching each task. Task data coupled with biographical data and program profiles resulted in descriptions of the various programs. Approximately 100 pages of supportive material are appended to the document. (AG)

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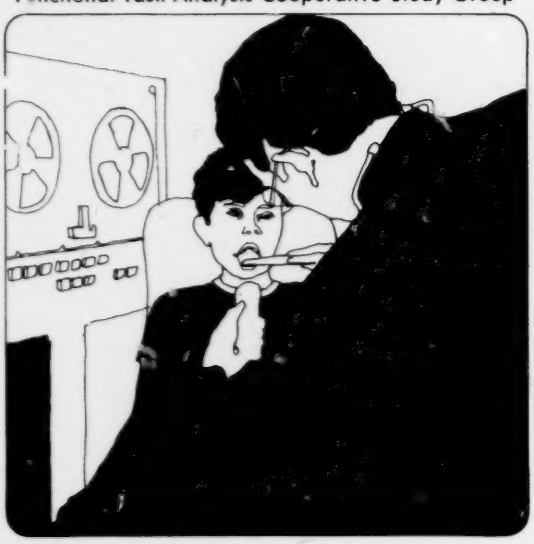
Methodological Study for Determining the Task Content of Dental Auxiliary Education Programs

Functional Task Analysis Cooperative Study Group



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PROGRESS REPORT

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Methodological Study for Determining the Task Content of Dental Auxiliary Education Programs

PROGRESS REPORT

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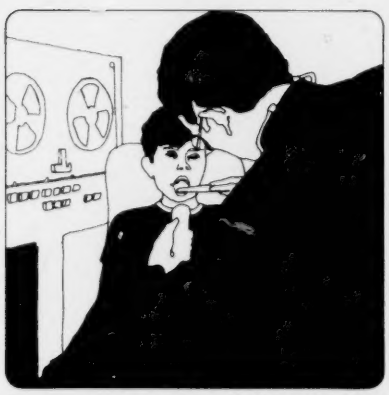

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David R. Terry
Rupert N. Evans

PREFACE

The research reported herein was performed pursuant to a research "compact" (No. MB 00014-01) with the Office of Special Programs, Bureau of Health Manpower Education, U.S. Department of Health, Education, and Welfare and with the following principal investigators of related research studies, who, as a group, constitute the Steering Committee of the Functional Task Analysis Cooperative Study Group: Dr. Rupert N. Evans, University of Illinois at Urbana-Champaign; Dr. David H. Gustafson, University of Wisconsin; Dr. Alfred M. Haynes, Charles R. Drew Post-Graduate Medical School; Dr. Arthur R. Jacobs, Dartmouth College; Dr. Lois C. Lillick, Department of Public Health, State of California; Dr. Marvin Marcus, University of California at Los Angeles; Dr. Maurice Wood, Virginia Commonwealth University; and Dr. Stephen R. Yarnall, Medical Computer Services, Seattle, Washington. The specific study of which this is a report was entitled Methodological Study For Determining Task Content Of Dental Auxiliary Education Programs and was directed by Rupert N. Evans as Principal Investigator and David R. Terry as Co-Principal Investigator. Grantees undertaking such projects under Government sponsorship are encouraged to express freely their professional judgement in the conduct of the research project. Points of view or opinions stated do not, therefor , necessarily represent official Bureau of Health Manpower Education position or policy. Further, this document constitutes the first formal report of the University of Illinois project to the Functional Task Analysis (FTA) Cooperative Study Group, and does not, therefore, necessarily represent the position or policy of the Steering Committee of the FTA Cooperative Study Group.

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CHAPTER I

INTRODUCTION

Nature Of The Problem

The health industry consists of a loosely associated network of agencies and facilities such as medical centers, hospitals, medical and dental clinics and offices, government agencies, educational institutions, and, most importantly, practitioners, all of which function through hundreds of types of activity to maintain, restore and protect the Nation's health. In 1972, $83 billion were spent on health care in the United States (AMA, 1973) and in doing so continued the health industry as the Nation's third largest industry at the same time the Nation continued its demand for still more services. With more than 4.5 million direct employees (USDHEW, 1973) the health industry is the Nation's largest employer, involving one in every twenty American workers. And yet, large as the health industry is, it nevertheless functions with only two principal types of personnel: (1) a cadre of physicians and dentists who are considered as the primary providers of health care, and (2) a large group of auxiliary personnel who work with or through the primary providers in the delivery of health services.

An examination of some of the relationships between the primary providers and the associated auxiliary providers of health care provides ample indication that changes are taking place within the industry regarding who is providing the health services it is designed to deliver. Physicians and dentists active in medicine, osteopathy, and dentistry numbered about 437,750 in 1971 (USDHEW, 1973). Between 1900 and 1971 these practitioners increased in number almost three fold (2.9 times).

However, as a proportion of the aggregate health manpower work force they declined from 44 to 10 percent of the total. Over the same period, the numbers of dentists alone increased numerically 3.5 times, while as a proportion of the aggregate of dentists and dental related auxiliaries, the dentists declined from 86 percent in 1900 to 39 percent in 1971. It would appear from these numerical changes in relationships that some significant changes are also occurring in the delivery of medical and dental health care. In fact, they raise at least two related questions in terms of today's health care, (1) Who is doing What in the delivery of health care services? and (2) Who is being prepared in which formal academic health-related educational programs to do What?

It was in the latter of the above questions that this study found its genesis, and specifically as the question related to the field of dentistry and to the formal academic preparation of dental auxiliary personnel.

Statement Of Problem

The primary problem of this study was to develop a methodology of collecting data regarding the dental tasks taught and the responsibility levels to which they are taught in the curricula of educational institutions preparing dental auxiliary personnel, i.e., dental assistants, dental hygienists, and dental laboratory technicians, and to evaluate the method for its potential usefulness in studying the education of dental auxiliaries on a national basis. The secondary problem of the study was to attempt to determine those differences among the educational institutions and their educators which may account for the varying numbers and kinds of tasks taught as well as the range of levels of responsibility at which the tasks are expected to be performed at the time of the student's graduation.

Importance Of The Study

While the delivery of dental care by a recognized professional has been available since shortly after 1840 when the first school of dentistry was established, it has been only during the past five to ten years that the practice of dentistry begun to take on some of the characteristics of a health delivery system attempting to meet the needs of the total society rather than the needs of a select few within the society. Formerly, the dentist worked alone and on one patient at a time, primarily delivering restorative dental services. In contrast, there are today large dental service corporations which provide hundreds of thousands of individuals with a dental care system through a cadre of dentists and dental auxiliary personnel - a system whose components include oral health education and preventive services as well as various kinds of restorative and curative services. As progress towards developing systems of delivering dental services was begun, however, there was and continues to be considerable difficulty in identifying, in defining, and in establishing the roles of the dental auxiliaries in relation to each other and to the practicing dentist.

Much of this difficulty has arisen as a result of the curricula and the various educational strategies used to prepare auxiliary personnel. Dental assistants, for example, may be prepared through formal institutional programs plus on-the-job training (OJT) programs or through OJT alone. Formal institutional programs range from those of a few weeks duration offered in proprietary schools to those extending over a twelve month period and offered as accredited programs in public or private schools and institutions. On-the-job training programs may range from a solo dentist taking someone into the practice to "help out around the place" to large clinic practices preparing many people to perform narrow ranges of highly specific tasks. While nearly all dental hygiene

programs are offered in formal educational institutions offering accredited programs (OJT preparation is recognized in Alabama), the programs may range from two to four years in length and be located in either dental school or nondental school settings. Finally, dental laboratory technician preparatory programs traditionally have been offered on a preceptorship (OJT) basis. However, within the past few years there has been an effort to establish programs in technical schools, community colleges, and senior institutions.

This multiplicity of approaches to dental auxiliary education appears to be one of the sources of difficulty in identifying, defining, and establishing the roles of the auxiliaries relative to each other and to the dentist. Indeed, with the exception of those dental schools engaged in giving the dental student some opportunity to work with dental assistants in the course of his/her training, there appears to be no dental education programs wherein a dental student and each of the auxiliaries are prepared together in such a way as to identify them as a team and how to work together. Further, with the recent movement into "expanded functions" programs by each of the auxiliaries, there has been a great deal of discussion of "What new responsibilities can the auxiliaries take on?"

The above question is being responded to not only by dental auxiliary educators, but also by dentists using dental auxiliaries in their practices. The former may derive their answers from several sources, e.g.: (1) from dental experts sitting on advisory councils, (2) from experimental programs designed to carefully investigate the extent to which a given auxiliary curriculum may be expanded, (3) or from a priori decisions. Educators may feel certain constraints as they ponder their answers, e.g.: (1) the tradition of the program, (2) the institutional setting in which the program is located, (3) the competencies of the faculty, (4) the limitations of the dental practice

act of the state in which the program is offered, (5) the influence of the local dental association, (6) whether the program is designed to prepare students to practice in any state or just in the local state. In a similar manner, the responses of practicing dentists to the question may be influenced by such factors as: (1) the resolutions and policies of the American Dental Association, (2) the state and local dental associations to which they may hold allegiance, (3) the state dental practice act, (4) the confidence of the dentist in the competencies of his/her currently employed auxiliaries, (5) the self-confidence of the dentist himself.

Given that dental auxiliary educators and practicing dentists are both responding to the question of "What new responsibilities can the auxiliaries take on?" the question now arises, "What are the agreements between their responses?" This question patently suggests the need for an evaluation methodology which may be applied equally to educational programs preparing auxiliaries and to dental practices utilizing dental auxiliaries. Such a methodology should lend itself to identifying the roles of the auxiliaries relative to each other and to the dentist and to producing the information necessary for currently defining each of the auxiliaries.

This study was designed to develop such a methodology. If the methods are successful, commonalities and distinctions among educational programs for a specific type of auxiliary can be identified as well as the commonalities and distinctions among educational programs for the dental auxiliaries. It is anticipated that the methods will be applicable to new types of dental auxiliaries as they may appear. Finally, and perhaps most importantly, the methods may be used to gather a minimum data set in a uniform manner from both the world of dental auxiliary education and dental care practice in such a way that correspondence between the education and utilization of auxiliaries may be identified.

Research Questions

The general problem identified above suggested a series of research questions which were used to provide direction to the development of the study - including the research design, the methodology to be developed for studying the dental auxiliary education programs, and the methods and techniques to be used in analyzing the data. The findings of the more specific research questions were utilized to determine conclusions pertinent to the general research questions and to develop hypotheses to be tested.

This study proposed to develop a set of instruments which may be considered appropriate and effective for collecting data concerning the (1) characteristics of educational institutions and their accredited programs which prepare dental auxiliaries, (2) characteristics of the institution's Faculty and Preceptors responsible for teaching dental and dental-related tasks, (3) dental tasks taught in accredited auxiliary education programs, and (4) level of responsibility to which auxiliary students are expected to be able to perform those dental tasks at the time of graduation from the program. From data obtained by these instruments the following research questions may be explored:

I. What is the reliability (stability) of the dental auxiliary educator's responses to dental task statements in an inventory questionnaire which has a large number of items?

   A. By respondents across all dental auxiliary education programs?

   B. By Faculty and by Preceptor across all dental auxiliary education programs?

   C. By respondents across all programs of a given dental auxiliary?

   D. By single-task task statements and by multiple-task task statements?

II. Are the Faculty and Preceptors (if used) of dental auxiliary education programs able to provide valid responses to a question regarding the accumulated total time he or she spends teaching <u>each</u> dental task he or she teaches in the curriculum?

III. What are the characteristics and descriptions of an educational institution, its accredited dental auxiliary education program(s), and the Faculty and Preceptors (if used) associated with the auxiliary program(s) which may distinguish among the number and types of dental tasks taught in the various programs?

A. By type of dental auxiliary program -- dental assistant, dental hygiene, dental laboratory technician?

B. By type of institutional setting in which a given dental auxiliary may be taught?

C. By the number of continuous weeks required to complete an educational program for a given dental auxiliary?

D. By the number of Faculty in a given dental auxiliary program?

E. By type of dental auxiliary as reported by the respective Faculty and by the Preceptors (if used)?

IV. What are the differences in the level of responsibility to which dental tasks are expected to be performed at the time the auxiliary student graduates?

A. By type of auxiliary?

B. By type of institutional setting in which the auxiliary program is situated?

C. By the number of Faculty in preparatory programs for a given dental auxiliary?

D. By level of educational completion for a given dental auxiliary?

E. As expressed by the Faculty and by the Preceptors (if used) of a dental auxiliary education program?

Definition Of Terms

For purposes of this study selected terms are used in the following context:

Criterion Class is the one currently enrolled dental auxiliary class which is nearest to completion or graduation in each institution studied.

Dental Auxiliary Personnel are health occupations personnel working in the delivery of dental care services whose occupations are identified as dental assistant, dental laboratory technician, or dental hygienist, and who have completed, or are completing the requirements of an educational program accredited by the Council on Dental Education of the American Dental Association. The work performed by these individuals is done at the discretion of a dentist who retains the legal, ethical, and moral responsibility for delivery of quality dental care as established by the dental profession and the legal practice acts of the state wherein the dental services are rendered.

Dental Assistant is the occupational title given to individuals whose work includes those acts of both supporting and delivering dental services in the general areas of operatory chairside assisting, education, reception and secretarial, and dental laboratory work.

Dental Hygienist is the occupational title given to individuals whose primary work includes acts related to providing oral prophylaxis and to providing preventive dental education but which may also include acts of both supporting and delivering other dental services allowable within the provisions of the state legal practice acts under which the dental hygienist is licensed.

Dental Laboratory Technician is the occupational title given to individuals who fill the dentist's prescriptions for various kinds of restorative and corrective appliances but may include other tasks in the general areas of operatory chairside assisting and education.

Faculty are dental auxiliary educators whose primary job responsibilities are performed within the educational institution itself and whose primary teaching responsibilities are directed specifically to the teaching of dental or dental-related tasks.

Preceptors are practicing dentists associated with a dental auxiliary education program whose teaching responsibilities are performed within a dental office or clinic outside the educational institution itself. Preceptors accept auxiliary students into their offices or clinics where they are provided clinical tutelage for specified periods of time.

Task Analysis is a process in which the work activities of persons bearing a given job title are separately identified and studied. Any job is the sum of the work activities or tasks associated with it. The unit of work activity called the task is of such a size that a meaningful production or service output can be associated with it. Similar tasks may be performed by persons having quite different job titles.

Limitations Of The Study

This study limited itself to collecting data from formal educational institutions offering dental auxiliary education programs which have either (1) provisional approval, (2) conditional approval, or (3) full accreditation status with the Council on Dental Education of the American Dental Association. It is recognized that other programs are available for preparing certain dental auxiliaries, but using the above criteria for selection provided at least

minimal, recognized measures of uniformity and quality among the programs selected.

The study also was limited to collecting data from the Faculty and Preceptors utilized in each of the selected institutions. As noted elsewhere (see Definition of Terms), the Faculty were limited to those individuals whose primary responsibility was teaching dental or dental-related tasks. This stringent definition precluded using individuals who may have been teaching dental-related tasks but whose primary teaching responsibility was to a broader group of students, e.g., business and office management faculty not teaching courses explicitly for dental auxiliary students. Further, guest lecturer type faculty were included only if it was determined by interview with the program director that the responses these individuals would make would not be included in the responses given by the regular faculty. In those cases where a preceptor also served as a guest lecturer, there was an attempt to secure the response of the preceptor as a preceptor rather than as a faculty member.

While every faculty member in each auxiliary program participated in the study, not every preceptor was asked to participate. Time and travel constraints required the use of a sample of preceptors from each program. However, since each auxiliary student did not serve a preceptorship under every preceptor, this limitation does not appear to be too critical to determining the nature of the program as experienced by most students.

Assumptions Of The Study

The assumptions underlying this study were that (1) a questionnaire and inventory approach to determining dental task components of the curriculum will yield valid data; (2) the task statements included in the dental task inventory

are valid tasks and are stated in such terms that the faculty and preceptors can identify whether or not these dental task statements are curricular outcomes for which they are responsibile; (3) the faculty and preceptors are able to identify the conceptual distinctions among the definitions given for each level of responsibility in the scale used in the task inventory.

CHAPTER II

REVIEW OF LITERATURE

Introduction

The primary problem of this study was the development of a task analytic method of collecting data regarding the dental tasks taught and the responsibility levels to which they are taught in the curricula of accredited dental auxiliary education programs; i.e., dental assistant, dental hygiene, and dental laboratory technician. This review of the literature will first present an abbreviated historical development of the dental auxiliaries utilized in the study together with a review of recent efforts to expand the scope of the dental procedures, functions, and tasks which these auxiliaries may perform in the delivery of dental services. The second section of the review will treat the subject of task analysis as it relates specifically to the definition and identification of tasks. A third section will deal with attempts to relate tasks identified in the world of work to the task content of educational curricula. The fourth section will deal with methods of analysis of task analysis data and methods of reporting these results.

Historical And Current Perspectives

The Dental Auxiliaries

Dental auxiliary personnel, as eventual providers of certain dental services and thus as components of a delivery system of dental services, had their beginnings over eighty years ago when Dr. Edmund Kelt of New Orleans placed a sign in his window noting "Lady in Attendance" (Gilman, 1967). These "Ladies" eventually became identified as "dental assistants" after the first formal dental assistant education program was offered in 1921. In 1913 the "dental hygienist" made an appearance as Dr. Alfred Fones in Bridgeport,

Connecticut, identified the occupational title and opened the first dental hygiene preparatory program (Joy, 1972). His stated purpose was to show the value of education and preventive treatments when applied to the mouths of school children. The "dental laboratory technician" developed almost entirely on a preceptorship basis and as late as 1965 there were only five formally accredited academic programs in the United States preparing these technicians (American Dental Association, 1971). From such informal beginnings and slow moving developments it is apparent that the dental auxiliaries have emerged from use rather than from being initiated through formalized educational programs.

Recent Trends In The Development Of Dental Auxiliaries

In 1947 the Council on Dental Education of the American Dental Association (ADA) initially established a set of "Requirements" for the accreditation of schools of dental hygiene and waited until 1965 for their first revision. The "Requirements" for schools preparing dental laboratory technicians were established in 1948 and not revised until 1967, and as recently as 1960, the Council prepared the initial set of "Requirements" for dental assistant preparatory programs.

Dental auxiliaries had been in existence for nearly fifty years when in 1946 the U.S. Public Health Service funded experimental programs which eventually led to the concept of "chairside dental assisting." Through two now classical studies which extended over five years (Abramowitz, 1964; Hammons and Jamison, 1967) and through short courses, practitioners were urged to experiment with what has become known as four-handed and more recently six-handed dentistry. In 1961 through a federal competitive grant program the Dental Auxiliary Utilization (DAU) Program was inaugurated in a few dental schools for the purpose

of exposing dental students to four-handed dentistry (U.S. DHEW, 1969).

But while the DAU program was trying to establish new methods of dental practice, the ADA was developing a "Statement of Policy Regarding Experimentation in the Training and Utilization of Dental Hygienists and Dental Assistants" (Transactions, 1961). The policy statement gave the Counil on Dental Education the authority to approve experimental auxiliary programs except those which proposed to initiate curriculum development in "restorative, prosthetic, orthodontic, and other procedures which require the knowledge and skill of the dentist" (Transactions, 1961). It was the sense of the Association that dental laboratory technician programs were not to be involved in such experimentation. This statement of national policy was, however, to be modified.

In 1966 the Council on Dental Education made a determined effort to encourage greater experimentation in the use of dental auxiliaries in the delivery of dental services. The Council expressed the view that the determination of duties that can be assigned to auxiliary personnel was the dual responsibility of the profession as well as educational institutions. In support of this philosophy, the ADA adopted the following resolution (Transactions, 1966):

> Resolved, that it is the responsibility of individual practitioners, acting through component and constituent dental societies and state dental examining boards to proceed promptly with studies, decisions and legislative actions which will help meet the manpower needs of the public, including the identification of additional functions which can be delegated to auxiliary personnel working under the direct supervision of the dentist. (p. 341)

Several experimental programs were developed following the action of the ADA in 1961 and its later action in 1966. Government agencies and universities developed experimental programs to prepare dental assistants and dental hygienists in specifically selected tasks or functions. Eventually the new tasks or functions became designated as "expanded functions," although no formal studies had been reported as to what functions were already being taught

to or performed by the various auxiliary personnel. "Expanded functions" have become generally recognized as those which the auxiliaries at some previous time had been specifically prohibited from performing, based on implications or direct statements in the previous "Requirements" for accredited programs and/or in each state's statutory dental practice acts.

But even with revised guidelines and practice acts, dentists and dental school faculties were slow to adopt new approaches to the delivery of dental care. In 1968 each of the fifty active schools of dentistry had a DAU program, but resistance on the part of their faculties to the concepts espoused by the program made it "very difficult" to implement significant changes in the delivery of dental care (Diefenbach, 1969).

In 1970, and after four years of debate over whether the ADA's existing policies (adopted in 1961) were too limited to permit sufficient latitude for experimentation with dental auxiliaries, the Council and the Association adopted the report of an Inter-Agency Committee on Dental Auxiliaries. This report outlined a set of general guidelines for the preparation and utilization of auxiliaries for use by the Association's constituent societies and by state boards of dentistry in establishing procedures for both immediate and long-range delegation of responsibilities for patient care. After adopting the Committee's report, the Association then passed the following resolution (Transactions, 1970):

> Resolved, that the Association encourage continued experimentation by recognized educational institutions, federal agencies and professional organizations on improved systems of providing dental health service through more effective utilization and assignment of additional responsibilities for patient care to dental hygienists and dental assistants, . . . and be it further
>
> Resolved, that the "Statement of Policy Regarding Experimentation in the Training and Utilization

> of Dental Hygienists and Dental Assistants" (Transactions, 1961: 221) with its subsequent amendments be rescinded. (p. 441)

These new directions allowed for further experimental studies in the formal education and preparation of all the dental auxiliaries, including the dental laboratory technician. The 1972 report of the Inter-Agency Committee encouraged "all appropriate agencies that are concerned with the education and utilization of dental auxiliaries to continue development of a more realisitc and effective system of auxiliary education" (Inter-Agency Committee, 1972).

Further, the Inter-Agency Committee adopted several basic principles which will influence future decisions regarding the preparation of dental personnel. Among those listed by the Committee are the following (Inter-Agency Committee, 1972):

1. Under present education requirements, existing accredited educational programs offer an unmatched resource for the teaching of expanded functions.

2. The profession and related auxiliary groups should make every effort as soon as possible to develop flexibility within the educational requirements for auxiliary training programs. This flexibility should permit the teaching of expanded functions without an increase in the length of the existing auxiliary curriculums as well as permit experimentation with shortened curriculums.

3. Research dealing with the education and utilization of expanded function personnel should be fostered by all appropriate agencies and educational institutions.

4. Although the Committee is convinced that American Dental Association policy should continue to provide a flexible framework within which states can make decisions, it recognizes the need for a greater degree of uniformity in educational program content and procedures for the teaching of expanded functions. If there is to be maximum manpower utilization and mobility, the auxiliary education system must not only prepare auxiliaries to function effectively in the immediate community and state, but also must prepare auxiliaries to function effectively in any state.

5. To expand its service to provide the best possible care for the people of this country, dental practitioners should employ qualified auxiliaries. The profession should continue its efforts to provide programs that will help all practitioners utilize auxiliary personnel more effectively.

As noted in the Inter-Agency Committee's report and in the early philosophy of the Council on Dental Education of the ADA, it was the dual responsibility of the profession as well as educational institutions to provide the task descriptions for the auxiliary personnel in the delivery of dental care. Such a philosophy acknowledges, first, that the educators which prepare dental auxiliaries have a perception of the "appropriate" task descriptions. Such perceptions, of course, may be stated explicitly or implied within the curricula developed for preparing auxiliaries who can perform the tasks as described. The appropriateness of the task description will depend upon several factors, among which are the type or kind of dental system with which the task descriptions are associated and the capacity of the developers of the task descriptions to produce valid descriptions for any system of delivering dental services.

Second, the philosophy recognizes that both the educators as well as the curricula of the educational institutions have an effect on how the graduates from their programs will be prepared to accept delegated tasks with their attendant responsibilities within a given dental delivery situation. The philosophy implied not only an interaction of the educators with the various dental communities (local, state, and national) and agencies related to the quality control of the schools and their products, but it also seemed to imply that the dental auxiliary educators should assume some degree of leadership for implementing the task descriptions operative in the dental care delivery system(s).

Third, the philosophy suggested a need to know where the auxiliary educational system is today. If the educators in the auxiliary programs were

to plan for expansion of the curricula into areas of expanded functions, it would be appropriate to determine which tasks are currently in the curricula and to determine the level of responsibility expected to be associated with the various tasks for each auxiliary.

The "Requirements" for accredited auxiliary programs have undergone recent revisions which have allowed those educational programs on the cutting-edge of change to change their curricula to take advantage of the more permissive "Requirements." The more conservative programs are not as likely to have undergone much change. To determine the bench-mark of the tasks taught in each auxiliary program would be most difficult, particularly when it is noted that there are over 380 dental auxiliary programs in the nation which have some type of accreditation status from the Council on Dental Education (ADA, 1973), and, yet, it appeared imperative to attempt to identify some bench-mark of tasks taught within each and among the programs. This effort was especially needed if consideration was to be given to the fourth principle among those noted earlier from the Inter-Agency Committee on Dental Auxiliaries.

It appeared, therefore, that a methodology needed to be identified for determining the auxiliary educator's perceptions of the role of the dental auxiliary with which they are associated, and more specifically the nature of those perceptions as made evident in the expected outcomes in terms of performances of the graduates they prepare. Using such methods as may be appropriate from such a methodology, it may well be possible to get back to the question of Who is being prepared to do What in the formal academic educational programs preparing health personnel, and to at least suggest indirectly an answer to the question of Who would be able to do What in the delivery of dental care.

Task Analysis

Webster's New World Dictionary (1966) defines task as "a piece of work

assigned to or demanded of a person." In the same dictionary the term analysis is defined as the "separating or breaking up of any whole into its parts so as to find out their nature." One might conclude, therefore, that the objective of task analysis is to identify either the nature of a piece of work or the nature of the total pieces of work assigned or demanded of a person. Indeed, both objectives for task analysis have been reported in the literature.

Charles R. Allen was, as far as this writer could determine, the first of what was to become a long list of writers to discuss the significance of analyzing the trade (job analysis) for the purpose of preparing a trade list (task inventory) which could be used as the building blocks (content areas) of a curriculum. In his book The Instructor, The Man, and The Job Allen (1919) sets out the principles and concepts which he had conceived a few years earlier and which brought him national aclaim during World War I. From his early preparation in the physical and chemical sciences, taken at the Massachusetts Institute of Technology and at Harvard, he approached, with scientific acumen, the monumental job of preparing a ship building manpower force sufficient to the country's wartime needs. Using the trade analysis techniques he developed and using the trade lists developed from the analyses, in thirteen months Allen supervised and directed the work of 36 instructor training centers which prepared over 1,000 instructors representing thirty trades. (National Association of State Directors of Vocational Education, 1928, p. 44).

Charles Allen's, method of job analysis was intended to serve two distinct functions: "(1) To serve as a training device for the teacher, and (2) to secure such essential facts concerning the trade which the teacher was expected to teach as would make it possible for a practical and sensible course of instruction to be formulated" (NASDVE, 1928, p. 42). The job analysis (trade

analysis), as Allen saw it, consisted of "listing out all the things that the learner must be taught if he is to be taught the complete trade" (Allen, 1919, p. 42). If less than the complete trade was to be taught, it was important "to pick out what [was] required in that case from the complete trade list [task inventory]" (p. 43). Allen had captured the essence of what was later to become known as occupational analysis, job analysis, and task analysis and to use the findings to devise relevant curricula.

Selvidge and Fryklund (1930, p. 66) recognized that "the analysis of a vocation on the basis of the jobs or duties one may be called upon to perform if he is engaged in that vocation is wholly inadequate from the stand of determining what should be taught." The reason for this is that one task may be reported in a large number of jobs or duties. If the task is taught, the worker can generalize its application in several jobs, and the efficiency of instruction is improved by minimizing repetition. (See also Miller, 1973). Foley notes that, "some sort of job task identification has always been included in good vocational training" (Foley, 1973).

The work of these early writers appears to be missing from the current literature of industrial psychology. Apparently since most of the early work in job and task analysis was applied to the building trades, production, manufacture, and military training, and since most of this work found its way into vocational education rather than into the more "academic" curriculums, little attention has been drawn to it (Foley, 1973).

Although the terms "task," and "job," have been used somewhat liberally in the foregoing discussion, they have not been explicitly defined. Their definitions are presented here as a glossary and to set the focus for the methodology used in this study.

In the opening paragraph of this section of the review of literature, the

words "task" and "analysis" were defined in general terms. The conclusion was then drawn that the objectives of task analysis may be to identify either the nature of a piece of work or the nature of the pieces of work and it was noted that both objectives may be found in the task analysis literature. As Foley puts it, "the process [task analysis] includes two levels of analysis - task identification or job analysis and analysis of the identified tasks" (Foley, 1973). But what is a task?

Fine (1971, p. 7) introduces the term task by using it in a section title: "Getting Hold of the Fundamental Unit of Work: The Task." He goes on to indicate that "A job is made up of a series of tasks and that training is designed to enable a worker to perform a series of tasks in his job" (p. 9). (Note that these descriptions are parallel to Allen's early descriptions.) Fine then provides a definition of a task, one which had evolved over a number of years at the Upjohn Institute (p. 9):

> A task is an action or action sequence grouped through time designed to contribute a specified end result to the accomplishment of an objective and for which functional levels and orientation can be reliably assigned. The task action or sequence may be primarily <u>physical</u>, such as <u>operating</u> an electric typewriter; or primarily <u>mental</u>, such as <u>analyzing</u> data; and/or primarily <u>interpersonal</u>, such as consulting with another person.

Several writers (McCormick and Tombrink, 1960; Miller, 1956 [cited in Altman, 1966, p. 13]; U.S. Department of Labor, 1965) define a task as a set of related activities which occur in sequence or closely together in time and which are directed toward a common goal, or outcome. Shartle (1959) indicated that

> a task is a distinct work activity carried out for a distinct purpose,

while the Armed Forces analysts define the task either as

> a unit of work activity which forms a consistent and significant part of a duty [Air Force] (Morsh, Madden, and Christal, 1961, p. 3)

or as

> one of the work operations that constitutes a logical and necessary step in the performance of a duty [Army] (Morsh, 1961, p. 3).

In the later definitions, the difficulty with identifying the task becomes dependent upon the definition of the term "duty." But, as Miller points out, "task analysis is an art, and as an art is largely dependent for its excellence and utility on the expertise of the task analyst" (Miller, 1973). In other words, task analysts are still working to develop a satisfactory approach to task descriptions (Miller, 1962, p. 188):

> It is important to differentiate heuristic description from scientific description of a set of events. A scientific description generally seeks to describe a set of events with variables which are mutually exclusive and have fixed, usually quantitative, relationships to each other . . . . In contrast, although heuristic descriptions may aspire to the rigorous characteristics of scientific description, they may be satisfied with much less. A sufficient criterion for a heuristic description is that it aids a job or class of jobs to get done. Task analysis at present is a heuristic description of activities at the functional interface of the human . . . and the objects, [individuals], and environments with which he interacts.

The systems analysis approach of the industrial engineers tends to lend itself to the development of task statements which reflect an interface between man and machine more frequently than between man and man. While this was reflected in Miller's definition (cited in Atlman, 1966, p. 13), Verdier's (1960) definition of a task provides some added insights (p. 37):

> A limited and orderly grouping of individual human activities applied methodically to things or equipment for the purpose of satisfying some problem or need.
>
> To clarify the definition; human activities in tasks are generally, but not always, <u>limited</u> to those per-

> formed by one individual within a convenient period of time, usually less than one day. These activities are orderly, in that they are grouped in a homogeneous manner with an observable start and completion stop. The task is composed of elements; these are simple, discrete responses which are carried out in a cumulative and progressive sequence. Task activities, or elements, are usually applied to, or concern, specific things or equipment. The things that task activities are applied to should be mentioned in the description of the task; as example; calibrate a voltage meter, adjust a carburetor, ship a container, etc. The purpose and activity of the task should also be inferred as a verb in the task description; this clarifies the problem or need for which the task is performed.

Verdier then suggests some useful principles to follow in breaking a task down into proper elements (p. 41):

a. The element should be the most simple form of discrete activity within the task, a single stimulus-response act, if possible.

b. An element should contain the smallest observable, continuous, integrated, activity within the confines of one central idea, as example; "Remove container cover."

c. Elements are reflective of the smallest coherent action relationship between the human and the equipment.

d. The element should have an observable start and a completion stop.

e. The central idea of what is to be done within the task element should not only be clear, but should be defined on the work-sheet as concisely as possible by some commonly understood verb. As example; "Remove the cover," "Read the gauge," "Insert the gasket."

f. If a single element accomplishes a task, the element may then be the task.

g. Elements are best presented on the task analysis worksheet in a logical, numbered sequence, in exactly the same order that these are carried out in the best performance of the task.

h. There should be a minimum of overlapping of the same elements within the total task breakdown.

i. Elements are best worded in the present tense, second person, and should start with an action verb; there may be exceptions, however.

j. Each element should contain some actual, observable activity; something the performer does.
   Examples: Thinking about what to do is not an observable activity. Looking, inspecting, or perceiving, by itself is not an observable activity. Waiting by itself is not an observable activity; however, waiting until the gauge reads 275 lbs. is an observable activity, as it contains a start and completion stop.

k. Elements are best stated in the task analysis worksheet in simple, concise, and commonly understood terms. Terms with a double or misinterpretable meaning should be avoided.

These elements, together with the previous definitions, offer useful insights into at least one portion of task analysis - that of identifying job tasks. But what are the structure and form of a task statement? Using the elements cited by Verdier and others (Fine, 1971; Miller, 1973), it is seen that a task statement consists of at least two basic components: first, and usually stated first in the statement, is an action the worker is expected to perform, and second, the result expected of the worker action. These components are identified in the following example: Place rubber dam clamp on tooth. The subject of the statement is implicit and is understood to be "I," "you," or simply the "worker." The action verb "place" is a concrete, explicit verb and indicates the result expected, the action, is that of affixing a rubber dam clamp on a tooth. In all cases an environment is assumed and also that the performer is sufficiently knowledgable to perform the task in the environment.

But what of the other elements or components suggested for inclusion in the task statement? It is at this point, as Bennet (1971) has recently noted, that one of the problems in defining the concept of "task" comes to light: what should be the level of inclusiveness (or complexity) for this unit of work - the task.

Beginning with the early writings of Allen and continuing into the current task analysis literature, one finds numerous examples of what are frequently referred to as "abbreviated" task statements. These statements, as illustrated in the example above, include only the action verb and the respondent action. As the behavioralistic philosophy, however, began to find its way into task analysis, the second portion of task analysis - that of analyzing the task - began to reflect the philosophy that (Miller, 1966, p. 197; Fine, 1971, p. 11; Stern, 1971; Verdier, 1960) additional components were needed to complete the task statement. The conditions under which the action was to take place needed to be specified; e.g., the tools, equipment, work aids, raw materials, the economy with which the action was to be taken - time and fiscal constraints, and the discretionary content of the task - what is prescribed and what is discretionary with respect to instructions or procedures should be identified. In addition, the criteria for the results expected should be specified; e.g., the reliability of the result, the quality of the result, and the quantity of the result. Depending upon the analyst and upon the purpose for which the task statement was prepared, the statement might be expected to contain any or all of the above additional components. For example, the abbreviated task statement may read, "Take patient's history." The complete statement may read, "Ask patient questions, listen to responses, and write answers on standard patient history form, exercising leeway as to sequence of questions and time for interview, in order to record basic history of patient's health."

In a current study of job analysis in the health services, Gilpatrick (1972, p. 3-2) has defined a task as

> a series or set of work activities (elements) that are needed to produce an identifiable output that can be independently consumed or used, or that can be used as an input in a further stage of production by an individual who may or may not be the performer of the task.

Gilpatrick further elaborates on the task by noting

1. In principle, someone other than the performer of the task must be able to use or consume the output of the task.

2. Theoretically, it should be possible for there to be an elapse of time between tasks.

3. A task includes all the possible conditions or circumstances which a single performer is expected to deal with in connection with a single production stage.

4. A task includes all the elements that require continuous judgment or assessment by the same performer in order to assure the quality of the output.

5. A task includes all of the elements needed to produce an output which can be independently used or acted upon without special explanations to the next performer in the next stage of production.

6. A task includes all the elements needed to complete an output to a point at which another performer (who would continue with the next production sequence) would not have to redo any elements in order to continue.

7. A task includes all the elements needed to complete an output to a point at which another performer, in order to continue with the next stage of production, need not perform extra steps.

8. The task must not require that, for another performer to continue with the next stage in a production sequence, current institutional arrangements would have to be changed.

9. A task must be sufficiently broad in statement that it can be rated on its frequency of occurrence.

10. Two tasks are the same if their elements result in the same output, require the same things to be used (including the alternatives to be chosen among in what is used), and if the kind of recipient, respondent or co-worker involved is the same in terms of what the performer needs to know in order to deal with the person.

It is quite obvious from the above definition and elaborations that Gilpatrick prepared a very detailed task description (statement) which lent itself as much to an "analysis of the task" as it did to an "identification of

the task." For example, one analyst's abbreviated task: "Remove patient's sutures," is written as a completed task statement by Gilpatrick: "Remove a patient's sutures using antiseptic, clamp, scissors, forceps; evaluating healing; deciding on ordering antibiotics, medication, irrigation and/or bandaging; recording" (Gilpatrick, 1972, p. B-15).

At this point, it is appropriate to return to Foley's (1973) point that "the purpose or purposes for which the [task] analysis is being made may determine how the tasks are identified." And as Miller (1973) notes, "there are many practical reasons that task analysts have not been overly worried about whatever might be meant by consistency in level of description [of useful units of work activity] . . . After all, the description is intended to serve a purpose for training, etc., and whatever is grist for the personnel mill is de facto justified." This is not to suggest, however, that an identified unit of work will, when stated in one form or another, always reflect certain contingency conditions related to its performance. It should be understood that a good portion of that which may be identified is not easily described in a single statement.

It was apparent from the foregoing review that while definite efforts are being made to place the work of task analysis into a more scientific frame of reference, there are still many variables associated with task analysis methodology that remain to be fully developed and defined. Indeed, as Miller (1973) has indicated, it is still too early to try to write a set of guides which may be expected to be useful in all, or even most, task analyses studies. It is evident from the literature, however, that the process of task identification must be accomplished at least under the direction of trained task analysts.

Dental And Dental-Related Tasks

In a review of the dental literature, it becomes apparent that the term "procedure" is used in at least two contexts. In the first context the word "procedure" is used to identify the things dentists do in the delivery of dental services. In the second context the word "procedure" is used to describe or identify the process by which dentists do these things. On the other hand, if one looks at the dental auxiliary related literature within the dental literature, it becomes apparent that the term "function" is used to describe the things dental auxiliaries do and the term "procedure" is reserved for describing or identifying the process by which the functions are done. These differences are relevant to both an approach to the identification of dental tasks and to the following additional definition of a task.

Jackson (1972, p. 5) indicates that a task is

> a separate and distinct part of a function requiring some physical or mental energy related to a specific purpose. To the extent possible, it is best to describe tasks in behavioral terms to more clearly depict what activity is to be performed to accomplish the task.

While this definition is similar to that of Fines (1971, p. 9), it does, nevertheless, make use of the term "function" in describing that of which a task is a part. Jackson goes on to indicate that a function is (p. 5)

> a group of tasks which are similar in nature. When expressed in behavioral terms, (for example, in the job description), the subject matter changes but not the behavior. A function therefore might include many individual tasks.

The above definition lent itself to use in this dental task analysis study designed, in part, to identify those things which a dentist may be delegating or allocating to dental auxiliaries. The definition not only makes use of the term "function" in a manner similar to the way it is used in dentistry, but it also suggests that functions may consist of several tasks or maybe a single

task in and of themselves. For the current study, however, it would be necessary to set the parameters around the definition to further delimit the task.

Using various of the elements of a task identified by previous writers, this study proceded to look for tasks which had the following characteristics:

a. Sufficiently discrete that someone other than the original performer should be able to use or consume the output of the task;

b. The task should consume enough time that by delegating or allocating it the dentist is freed to pursue other "procedures" or tasks;

c. The task includes all the "normal" or "routine" conditions, circumstances, and judgments which the dental auxiliary is expected to deal with in order to assure the quality of the output;

d. The task includes all the elements needed to complete the output to a point at which another dental auxiliary, the dentist, or another worker would not have to redo any element in order to continue; (and)

e. The task is sufficiently broad in statement that it can be recognized without undo cause for question of overlap with other tasks.

It was anticipated that this study could identify from the literature a list of dental procedures, functions, and tasks which could be used as a base for constructing an inventory of dental task statements which would meet the above definition and expansion. A search of the literature revealed dozens of articles and reports which contained such information. In the studies of Parks (1972a and 1972b), Kilpatrick and MacKenzie (1972a and 1972b), Kingston and Freeland (1971), Morsh, Adkins, and Boyce (1968), and the U.S. Air Force (1969, 1973a, and 1973b [note: the latter two date citations are current revisions of previous inventories]), actual attempts were made to make a formal task analysis study and, except for the report by Kilpatrick, each report contained a dental task statement inventory <u>per se</u>. The following were major

sources for the Dental Task Inventory used in this study: ADA, 1971a and 1972; Hammons and Jamison, 1967; Lotzbar, Johnson, and Thompson, 1971; Brearky and Rosenblum, 1972. In addition, suggestions and informal sources, such as the UCLA Dental School faculty, were utilized as resources for content and construction of the task inventory.

The Educational Curriculum And The World Of Work

It is not uncommon to find references to early vocational education curricula which were built from task analysis-type study or review of the occupations and jobs from which the educational programs drew their identities. Indeed, the work of Allen (1919), and Selvidge and Fryklund (1930) are but examples of such curricula development. Allen stressed the need to not only conduct analyses of the trade when considering the curricula, but also the advantages, if not the need, to hire a trained and experienced worker from the job or trade to do the teaching.

Allen's idea of selecting teachers from among the trained and experienced work force caught on in not only the vocational programs but also in other fields, although it was primarily in the vocational programs that curricula were built on findings from task analysis studies. Eventually, however, it became apparent that the task analysis approach, using interviews and observations from the world of work, turned into a case of the teachers (who naturally regarded themselves as experts) talking among themselves as they evaluated the relevance of the curricula. This was not so bad as long as there was considerable turnover in the faculty with new faculty drawn from the current world of work. But, as the faculty replacements began to come directly from their formal training, without occupational experience, cries of irrelevant programs and accountability for what is taught were heard.

One of the objectives of this study was to develop a task analytic method of determining certain portions of the task content of a curriculum and to do it in such a way that analogous information from the world of work could be obtained using the same instruments. Previous studies by Schill and Arnold (1965) had provided a method for evaluating the relevance of the curriculum content among post-secondary technology education programs as measured by the responses of employed technologists working in the respective technologies. While this study was curriculum content oriented, it was not specifically task content oriented.

As the literature was further reviewed to find studies closely related to the objectives of this study, none could be found. Considering that the reviewer might not be reviewing the right subject areas, telephone calls were placed to several experts in the field of task analysis type research in an attempt to discover the proper areas of the literature to search. The reviewer concluded there were no studies directly relatable to the stated objectives of this study after communicating with the following individuals who have been extensively involved in task analysis:

> Dr. E. J. McCormick, Occupational Research Center, Purdue University;
>
> Dr. H. L. Ammerman, Instructional Systems Design Program, The Ohio State University;
>
> Dr. R. E. Christal, Air Force Human Resources Laboratory, Lackland Air Force Base;
>
> Dr. J. W. Cunningham, Center for Occupational Education, North Carolina State University; and
>
> Dr. E. P. Prien, Personnel Psychology, Memphis State University.

As Christal (1973) has noted, the U.S. Air Force began its Occupational Research Project over fifteen years ago with objectives which included job analysis, job performance, performance evaluation, job requirements, and so on.

Using task inventories to continuously monitor changes in jobs, the Project has been able to work closely with the Air Training Command in developing and maintaining the task content of the curricula for the occupational career ladders identified by the Service. In addition, the Air Training Command training centers continuously monitor their training courses to (U.S. Air Force, 1972, p. i):

> determine the ability of graduates to perform the tasks required in the field during their [graduates] initial job assignments; to discover any specific areas of inadequacy in the training provided by the course, as evidenced by graduate performance; to discover any areas of undertraining or overtraining in the course; and to learn of any internal factors in the operation of the training programs which might have an adverse effect on the quality of the training provided by the course.

These systems of curriculum development and evaluation provided insights for the current study; however, since the dental auxiliary education programs encountered in the civilian world have not been either constructed or monitored in such a manner as those in the military world, it was not possible to make a direct application of these methods in meeting the objectives of the current study.

In earlier studies conducted by the U.S. Air Force Air Training Command (Teske, 1973; U.S. Air Force, 1954; U.S. DOD, 1965), procedures were developed to identify course training standards which were "primarily an inventory of jobs performed by the student while undergoing training and [are] therefore basically job analysis of a training course" (U.S. Air Force, 1954). While this definition of Training Standards is not dissimilar to that currently utilized by the Air Force, the course evaluation procedures went a step further than that mentioned above. In the latter evaluations the instructors in the training centers were ask to identify the specific tasks they were teaching and the level of proficiency to which they were teaching them. If instructors reported they were

not teaching a task, they were asked to identify the reason for the omission. Or, if the task was taught to a proficiency level other than the one specified for the course, the instructor was also asked to account for the difference.

This methodology appeared to be relevant for educational programs built from a task analysis base, but it could not be used where neither the tasks nor the levels of proficiency had been explicitly identified in the curricula.

The UCLA Allied Health Professions Projects (Kingston, 1971, p. iii) was designed to prepare curricula and instructional materials relevant to a number of allied health professions (including nursing) by identifying those tasks identified with each of the occupations or professions. The Projects did identify a number of task inventories and some curriculum materials were developed and published. The objectives of the projects, however, was on the development of educational materials as opposed to the determining of the task content of the curricula then, or now, in existence. Further, while the long term goals of the project were to maintain a current task inventory for further curricula development and revision, no guidelines were identified for maintaining an evaluation of the task content of the curricula being used.

In a study initiated by Tomlinson, Bailey, Hindhede, and Langdon (1969) and continued by Kerr, Petersen, Hoadley, Holloway, and Davis (1970), 99 nursing functions (tasks) were identified and questions about them were asked of employed licensed practical nurses and their registered nurse supervisors, and of the faculty members of 45 licensed practical nursing educational programs. These studies used a selected task inventory to evaluate the relevance of the curriculum content of the educational programs. The task statements also were designed to identify the range of tasks taught in the curricula and the range of functions performed by the employed licensed practical nurses (LPNs). The tasks were not, however, designed to identify the total task content included

in the educational programs or the total of the tasks performed in the employment setting. The studies were unique, however, in that the same task inventory, together with the same questions and response scales were used to compare the types and range of tasks performed on the job (as evidenced by the LPNs and by the LPN nurse supervisors) with the types and range of tasks included in the educational curricula preparing the LPNs. These two studies were the only studies identified in this review which attempted to evaluate the relationships between the tasks identified in the civilian world of work and in the educational programs preparing graduates for employment in the respective occupations and professions. The response scales utilized in the two studies will be discussed in the following chapter.

Methods Of Analysis

In the present study the emphasis of data anlaysis was placed on the ability of the instruments to (a) describe the task content of the individual dental auxiliary curricula, and (b) to describe those differences among educational institutions and their faculty which might account for difference in task content within an auxiliary and/or among the dental auxiliary education programs.

In reviewing the literature reported above, the studies provided data which tended to identify the task or curriculum content as the unit of observation (the independent variable) and to relate various dependent variables to the tasks. Such methods as these provided the opportunity to perform factor analysis and correlation studies to identify significant relationships between the observations (tasks) and the dependent variables. Indeed, in the studies by Gilpatrick (1972) and by Schill (1965), both simple and two-mode factor analyses were utilized. This allowed, in the case of the Gilpatrick study,

not only the identification of the principal variable factors but also provided a method for grouping or clustering the tasks by rank order. However, while these methods of analysis and those used by Tomlinson (1969) and Kerr (1970) were appropriate to the reported studies in which they were used, they did not provide a mechanism for treating the data in this study.

The Dental Task Inventory utilized in the current study contained 563 task statements. To deal with an analysis of such a large number of variables presented a major problem to the study. Further, after the data had been screened, it was apparent that the distribution was neither normally distributed nor did it have sufficient variance for effective correlational studies. These findings led the investigator to dismiss such analytic treatments as those based on correlational measures of the data not to mention the problem of having fewer total respondents than there were variables (task items) in the study.

Discussion with faculty of the College of Education and the Center for Advanced Computation at the University of Illinois suggested that a Hierarchical Clustering Scheme developed by Johnson (1967) might lend itself to the data. The method was found to be of use and was used as a method for comparing the content of one educational program with that of every other program. The method of analysis is reported fully in the following chapter. It should be noted that the HCS was used to make comparisons across the profiles of each dental auxiliary education program. More detailed analyses of specific responses to the task statements by performance category, levels of responsibility, background of respondent, etc., can be made for detailed program descriptions or comparisons.

CHAPTER III

METHODS AND PROCEDURES

This study was conducted among selected dental auxiliary education programs in a midwestern state as a pilot study for developing a methodology suitable for conducting similar studies among the states or at the national level. The basic design of the study used standard techniques of survey research, i.e., administration of a structured research questionnaire to a sample of the population under study and an appropriate analysis of the data gathered. The several phases of the study included: (1) sample selection, (2) development of instruments, (3) gathering of data by structured interview and mail-back questionnaire and (4) analysis of data. Each of these phases will be discussed below.

Sample Selection

Dental Auxiliary Education Programs

Although the titles of dental therapist and dental nurse are found in the literature, it is generally agreed that almost all auxiliary personnel associated with the direct care of civilian dental patients in the United States are of three types: dental assistants, dental hygienists, and dental laboratory technicians. It was with these auxiliaries, therefore, and with their educational programs that this study identified itself.

In selecting those dental auxiliary education programs to be studied it was recognized that a great number of both dental assistants and dental laboratory technicians receive their preparation for work through informal on-the-job training (OJT), and that this work force currently contributes greatly to the expanded manpower utilization practices in the delivery of dental health services. However, very few, if any, of these informal preparatory

programs are formally evaluated by either their peer or related professional associations.

In contrast, those formal academic dental auxiliary education programs which are accredited by the Council on Dental Education of the American Dental Association are not only recognized but offer some assurance that their graduates are meeting certain minimal standards of acceptable preparation for delivering dental related services. In addition, these auxiliary education programs can be identified with accredited technical institutes, community colleges, and senior institutions with and without associated schools of dentistry. Each of these educational settings, together with their associated levels of program completion (certificate; Associate, Baccalaureate, and Master's degree), offer a potentially different approach to the formal preparation of dental auxiliaries.

Consistent with the purposes of this study, therefore, and due to the constraints of time and fiscal resources, this study was limited to an examination of those accredited dental auxiliary educational programs in a midwestern state and in accredited institutions of higher education.

Sixteen educational institutions were then identified which met the above criteria. They offered 21 accredited dental auxiliary education programs (twelve dental assisting programs, seven dental hygiene programs, and two dental laboratory technician programs). Among the sixteen institutions were technical institutes, community colleges, and senior institutions with schools of dentistry. The institutions were further categorized according to the availability of clinical education facilities: (1) those using only their own in-house clinic(s), (2) those without in-house clinics and thus dependent upon the clinics of preceptors, (3) those making use of both in-house clinic(s) and preceptor's clinics, and (4) special cases where in addition to one of the foregoing, military or other government clinics were associated with the programs

through which the students could gain experiences which transcended the limitations which may have been imposed upon the program by the dental practice act of the state in which the study was conducted.

To secure a sufficiently large number of individuals as respondents (see Respondent Selection below), it was determined appropriate to make a study of each of the 21 dental auxiliary education programs in the sixteen institutions.

Respondent Selection

In addition to focusing on the educational institutions and their dental auxiliary education programs, it was essential to consider the appropriate type of respondent to be selected from the programs. Although the faculty or the students, or both, could have been asked to respond for the study, it was decided to seek faculty responses. This decision was not based on considerations of the expected validity of the faculty's response as compared to that of the students, rather it was based on the practicalities of timing and of resources. If students were to be considered as respondents, they would have to be queried about their particular auxiliary education program immediately prior to their completion of the program in order for them to be conversant with all tasks taught in the program. To wait until after graduation would require additional time and resources for finding the graduates, to say nothing of the effects of post-graduation employment experiences or of the effects a longer recall period may have had on their responses.

Further considerations of the term "faculty" led to the decision to limit the scope of the institutional faculty to be solicited. Recognizing that the study was to be oriented to evaluating dental auxiliary education programs for the dental or dental-related tasks taught in them, the decision

was made to eliminate those of the faculty whose primary teaching responsibilities did not include the teaching of dental or dental-related tasks. This limitation, for example, excluded those faculty teaching foundations in the basic biological and physical sciences except as a particular course may have explicitly included the teaching of selected dental tasks. In a similar manner, those faculty teaching business and accounting courses were excluded except in cases where a specific section of a course was designed specifically for dental auxiliary students. The decision to use this restricted definition of "Faculty" was made in order (1) to facilitate the identification of specific faculty who were acutely aware of their role in the auxiliary education program, (2) to utilize those faculty most likely to have contact with every auxiliary student, and (3) to avoid diluting the data with responses of every institutional faculty member who may have taught one or more of the auxiliary students in some section of a generally required course in the auxiliary curriculum.

As noted above, some dental auxiliary education programs use the services of practicing dentists as preceptor faculty. While these dentists are variously recognized by the institutions with respect to their type and terms of appointment to the faculty, they play a very significant role in some dental auxiliary education programs. It was deemed necessary, therefore, to include such individuals among the respondents. Since it was not likely, however, that every auxiliary student would serve under the tutelage of every preceptor, these respondents were recognized as "Preceptors" rather than as "Faculty" in identifying the respondents.

There remained those potential respondents who were considered as part-time faculty or as guest lecturers to the auxiliary programs. The decision was made to include these among the Faculty respondents only if after interviewing a program director, it was determined that no other regular member of

the Faculty would likely respond to the content area covered by that part-time faculty member or guest lecturer. In cases where a practicing dentist was observed to fill both the roles of preceptor and of guest lecturer or part-time faculty, his or her response would be solicited as a Preceptor.

After defining the faculty to be included in the study, an attempt was made to determine the actual number of potential respondents in each of the 21 auxiliary education programs. A review of each program with the program director for potential respondents indicated a range from two to ten or twelve among the programs. Dental assisting and dental laboratory technician programs would, on the average, have a faculty of four while dental hygiene would have slightly larger faculties. With such a small faculty in each program, it was determined that each student would most likely receive at least some portion of his or her education from each of the faculty. Accordingly, it was decided to attempt to enlist the cooperation of every faculty member in every program. This approach would increase the assurance of a program's evaluation being reflective of the entire program and at the same time provide for a larger group upon which to test the data gathering instruments.

An evaluation of the number of potential Preceptor respondents indicated that in excess of twenty were used by nearly every auxiliary program using preceptors. Since, as noted earlier, it was unlikely that each student would work under each Preceptor, and since it would have required both time and resources beyond the scope of the study, it was decided that the Preceptors would be sampled.

Finally, in those institutions having two dental auxiliary education programs and where members of the faculty from either or both programs teach in the other program, it was decided to attempt to elicit a response from each of these faculty to all data collection instruments used in each of the

programs with which he or she may be associated. This would provide an opportunity to determine those differences which may exist between two programs, and taught, at least in part, by the same faculty.

The results of using the procedures noted above are reported in the following chapter under the section "Sample Characteristics."

Development Of Instruments

Dental Task Inventory

In order to study dental manpower utilization with an expectation that task delegation or allocation may be possible, one must begin with a descriptive analysis of what dental tasks are currently or may be performed and by whom. It is generally understood that many of the dental tasks heretofore performed only by the dentist are being delegated or allocated to dental auxiliaries. What is not understood, however, is (1) which tasks are being delegated or allocated, and (2) to which auxiliaries they are being delegated or allocated (assistants, hygienists, laboratory technicians, or perhaps to some new type of expanded function dental auxiliary personnel).

As noted in the review of literature for this study, several attempts have been made both to identify the nature of dental work, and thereby the dental or dental-related tasks performed in selected dental practices, and to derive through experimental dental and dental auxiliary education programs a number of new or additional dental tasks which might be included in the content of dental auxiliary education curricula. In the former studies, those dental tasks identified as being performed by dental auxiliaries may have found their way into the practice of dentistry either through formal auxiliary preparation, through on-the-job training or through both of these means. In the latter case of experimental education programs, there appears to be no way, at present, of

identifying those new dental tasks which have found their way into nonexperimental auxiliary education programs.

To identify a number of dental tasks which may be related to both the world of dental practice and the world of dental auxiliary education, this study sought to develop from the literature, other studies, and from expert opinion a library of dental task statements. Prior to preparing the library, however, two decisions were made relative to its eventual content. First, the specific kind of work performed within the confines of a dental practice from which the tasks were to be drawn were considered. For the purposes of this study, task statements were to be drawn from three broad kinds of work: (1) business and office management, (2) housekeeping - clinical and general, and (3) dental patient care (including dental laboratory work).

Second, the dental tasks had to have a "grain size" or comprehensiveness of context relative to their use in the study. They had to be observable acts and cover such a time duration that they occupy some meaningful portion of a dental or dental-related procedure. Indeed, if a task may be identified as being delegable or allocable to an auxiliary, that delegation or allocation must of consequence release the dentist or other responsible personnel to perform another task or procedure in the interim. Finally, the task must be a unit of work activity sufficiently self-contained that it would be recognizable from job to job or from employee to employee.

A library of over 4,000 dental and dental-related task statements was derived from an amalgamation and adaptation of dental procedures and task statements previously identified (Kingston and Freeland, 1971; Morsh, et al., 1958; American Dental Association, 1972; Kilpatrick and MacKenzie, 1972; Lotzkar, 1971; Parks, 1972). The library was then punched into computer tabulation cards, filed in a computer storage system and then screened for

duplicate statements using a "Key Word Out of Context" computer program print-out of the library. After all duplicates had been removed, the resulting library was then submitted to a review panel of five dentists (educators), a dental assistant, and a health occupations teacher educator to assess their relevancy to the scope and objectives of the study. Subsequent revisions of the library were made by the panel to establish a usable range of grain size of the task statements.

Since it was assumed by the panel that some dental functions or tasks were more likely than others to be delegated, allocated, or taught to dental auxiliaries, an arbitrary decision was made to formulate dental task statements of unequal grain size. For those dental procedures or functions considered most likely to be partially or completely delegated, allocated, or taught to dental auxiliaries, a series of task statements was generated to identify the procedures or functions by their task parts. Consequently, some "task" statements may be recognizable as parts of a dental function while others may appear to be at the level of the function itself. For example, the excavating of a dental caries, the placing of the matrix band, the placing of the amalgam, the carving of the amalgam, and the polishing and finishing of the dental restoration may be considered by some educators and dental practitioners to be a series of work units (tasks) comprising a dental function (the restoration of carious tooth). Others may consider any one or some combination of these tasks to be a function.

Eventually, an inventory of 563 dental task statements was selected from the library and agreed upon by the panel noted above, whereupon questions arose as to their presentation in the study: (1) "How many of the tasks (or which tasks) within the inventory should be included in a questionnaire type instrument?" and (2) In what order should the tasks be presented within the

instrument?" To the first question it was reasoned and accepted that since it was not known which tasks were being delegated, allocated, or taught to dental auxiliaries, the entire inventory should be presented in the pilot instrument.

To the second question, there was the point of view that the task statements should be arranged by some category sequence to facilitate their recognition. It was observed, however, that many of the statements would fit into two or more possible categories and their absence from any one of the categories would be obvious and lead to confusion. To place each task in all appropriate categories would have added repetition beyond that which the respondents might be expected to endure. It was further reasoned that to present the tasks by categories may present "mind sets" to the respondents. That is, given the number of task statements to be included in the instrument, there may be a tendency for the respondents to skip certain categories of statements on the assumption that "I don't deal with or do such tasks as will be in that category." On the other hand, there was the argument that the tasks should be placed randomly in the instrument. This would alleviate the chance for establishing mind sets to certain groups of tasks. At the same time it would place the respondent in the position of asking him or herself about each of the various procedures or functions wherein the task may be performed. The decision was made to present the tasks in random order.

Since it was not the intention of this study to create a static library of dental task statements, it was decided to label the dental task questionnaire a Dental Task Inventory. Inherent in this decision was the concept of using the Inventory as a modus for continually refining the library and for establishing some bench marks as to those tasks which appeared to be specific to a given dental auxiliary. Consequently, it was expected that subsequent inventories would be different from the initial inventory and more reflective

of the dental auxiliary for which it may be prepared. A decision was made, therefore, to title the initial questionnaire as a Dental Task Inventory and further to identify each inventory as if it were prepared for use in evaluating a specific dental auxiliary. An example of the Dental Task Inventory used in this study is presented in Appendix A and a listing of the 563 task statements may be seen in Appendix F (categories identified in this appendix were not included in the inventory itself).

Response Scales To Dental Task Statements

In addition to identifying the dental tasks to be included in the Dental Task Inventory, it was necessary to develop an appropriate question and response scale for the Inventory which would yield more than a "yes" or "no" response as to whether or not a specific task was being taught. To evaluate the tasks taught within a particular program in the light of their potential for delegation or allocation, it would be important to ascertain the perceptions of both the Faculty and the Preceptor regarding the level of competency or responsibility which should be associated with the graduate's performance of each task taught. It is one thing to prepare the auxiliary to perform a task only under the conditions of direct supervision, but it is quite another to develop the competence (and associated responsibility) to perform the task under conditions of some shared responsibility or with independent responsibility. Only with the latter two levels of competency would it be possible to delegate tasks to dental auxiliary personnel to the extent that the dentist's time could be reallocated. It was considered appropriate, therefore, to develop a question and response scale which would produce a faculty response regarding not only whether or not a specific task is taught, but to present a series of responses which would elicit some measure of the Faculty's and of the Preceptor's <u>intent</u>

regarding the level of competence to which they expected their graduates to be able to perform the task.

To develop the appropriate type of question and response scale to obtain the level of performance (responsibility) expected of the auxiliary graduate, this study turned to a four-year longitudinal study of the "Occupational Patterns and Functions of Employed LPNs" by Tomlinson, Bailey, Hindhede and Langdon (1969). The study developed and used a three-level scale for indicating the capabilities of the LPNs to perform tasks at three levels of responsibility. The responses, as modified for this current study, are as follows:

1. Not taught - Task not taught by or under the direction of the respondent
2. Direct supervision - Actions of this type include those where the graduate (a) is given a specific instruction to perform an action and report back immediately following its completion, (b) assists a higher level person with the action, or (c) performs the action under observation.
3. Shared responsibility - Actions of this type include those where there is some intervening activity by a dentist or other responsible person. This might be a situation in which the graduate's supervisor would give verbal instructions to perform an action, and it would not be necessary to report back to the supervisor upon completion of the action. The fact that another person has taken some action relating to the performance at the time of the performance gives them a part of the responsibility.
4. Independent responsibility - Actions of this type include those kinds of actions where the graduate may make an observation during his/her normal duties and/or take an appropriate action without

checking with or getting additional instructions from some higher level person. Other situations may be where (a) standing orders, (b) specific instructions recorded on the patient's chart or (c) established policies of the practice site would allow graduates to perform the task action "on their own." It may or may not include a recording of their action.

It was determined from the Tomlinson study that licensed practical nurses, their supervisors, and nurse educators could respond to 99 identified tasks performed by LPNs and give meaningful reasons and explanations of their decisions regarding the option selected on the response scale (Tomlinson, 1969, p. 120).

In an attempt to determine what the time relationships were for teaching various dental tasks to noted levels of responsibility, a second question was also presented with the task statements in the Dental Task Inventory. A response scale was developed which allowed the respondent to select an interval of time which indicated his or her total time devoted to developing the responsibility level to which a given task is expected to be performed by the graduate. This question and its scale are presented in Appendix A.

Biographical Data Instrument

To identify those characteristics of the Faculty and of the Preceptors which may be pertinent to an interpretation of salient difference which may be noted among the auxiliary education programs, a Biographical Data instrument was developed and attached to the front of the Dental Task Inventory instrument. The instrument may be seen in Appendix A.

Site Characteristics Data Instrument

A data collection instrument was designed, in two parts, to collect selected information about each of the educational institutions and their dental auxiliary education programs. Part one of the instrument was used for conducting a telephone interview with the director of the auxiliary program prior to completing Part 2, an on-site interview with the director and with the program's staff (Faculty and Preceptors). Examples of the two-part Site Characteristics Data instrument are included in Appendix B.

Data Collection

Interviews

The director of each dental auxiliary education program selected to be included in the study was contacted by telephone and interviewed to determine whether or not the individuals associated with the program would participate in the study. The interview was continued to collect selected information relative to the educational institution and its auxiliary program(s). A date was then set for making the on-site visit with the director and the program's staff. (See Appendix B for example of telephone interview form.)

At the time of the on-site visit an interview was conducted first with the program director for the purpose of further identifying the purposes of the study and to continue with the collection of data regarding the institution, its auxiliary program(s), and its staff of Faculty and Preceptors. Following this interview, a meeting was held with the Faculty to introduce them to the purposes of the study and to solicit their cooperation. For those Faculty not in attendance at the meeting, the program director was asked to obtain his or her cooperation by making a presentation similar to that of the study's staff.

Individual interviews by the study's staff were then conducted with as many of the selected Preceptors (if used in program) as could be contacted and enlisted in the study.

As an incentive for each program's director, Faculty, and Preceptors (where used) to participate in the study and in an attempt to elicit their best efforts in responding to the Dental Task Inventory questionnaire, each auxiliary program was assured of receiving report unique to their program. The report was to consist of two parts, the first of which was a Faculty and Preceptor frequency response, by level of responsibility, to each of the 563 dental task statements. This part of the report would provide the program with a bench mark for identifying those dental tasks currently in the curriculum and with an index of the level of responsibility to which each of the tasks was being taught. The second part of the report was to be a Faculty frequency response, similar in format to that described above but identifying, by auxiliary, the combined response of all Faculty respondents in each auxiliary. This would allow each auxiliary program to compare their program with the combined total response for all similar auxiliary programs and with the combined responses of the other two dental auxiliaries.

In a further attempt to elicit honest and unbiased responses to the questionnaire, each auxiliary education program and each respondent within the program was assured personally of response anonymity through the use of a questionnaire identification coding system with a number unique to each individual. In addition, each respondent was provided with a return-addressed and stamped envelope for returning the questionnaire.

Criterion Class

Given that some auxiliary education programs would have more than one class of students currently enrolled, and assuming that the curricular content

for any one class of students may vary from that of another class, a "criterion class" of students was defined for which all respondents would be asked to respond. The criterion class was the one currently enrolled dental auxiliary class which was nearest to completion or graduation in each institution studied.

Perspective For Faculty and Preceptor Response

The study of a dental auxiliary educational program may be approached from at least two perspectives when the study is to be based upon the teaching staffs' understanding of the curriculum's task content. From the first perspective, one may ask the staff to respond to each statement in terms of "Is it your understanding that this task is included in the content of the curriculum?" To respond to this question the respondent must know not only those parts of the curriculum for which he or she is personally responsible for teaching, but also those parts of the curriculum for which others on the teaching staff are responsible. To further respond to the question in terms of the responsibility level to which each task is taught, the respondent must also know the appropriate responsibility response for those tasks taught by himself and for those tasks taught by others on the staff.

From a second perspective, one may ask the staff to respond to each of those tasks in the curriculum content which he or she teaches or which are taught under the respondent's direct responsibility. To determine the curriculum's total task content using this perspective requires the cooperation of the entire staff. But, given that occupation, together with an equal chance for unbiased responses, it may be assumed that analysis from this perspective would produce a more valid determination of both the task content of the curriculum and the levels of responsibility to which those tasks are taught than would a determination from the first perspective.

The following conditions were assumed to exist: (1) the number of Faculty in each of the auxiliary education programs was relatively small (4 to 6); (2) there was a good probability that all Faculty members could be identified; (3) knowing of the esprit de corps that is often found among small health occupations faculties, there was a good probability of enlisting the cooperation of all Faculty members in responding to the Dental Task Inventory; (4) the likelihood of each student being taught by all Faculty members was high; (5) in those auxiliary programs using Preceptors not every student serves under the tutelage of every Preceptor; and (6) each Preceptor is not likely to know the tasks taught, delegated, or allocated by every other Preceptor and Faculty member. Given, therefore, the conditions and the arguments presented above, the second of the two perspectives was selected for couching the two questions to be associated with each task statement in the Dental Task Inventory:

A. To what level will the graduate of the program be able to perform this task upon completion of the courses and other learning experiences given by you or under your direct responsibility?

    1. Not taught under my direction
    2. Will be able to perform only under direct supervision
    3. Will be able to perform with shared responsibility
    4. Will be able to perform with independent responsibility

B. How many of the organized hours of instruction in the courses/labs/clinics taught by you or under your direct responsibility are devoted to developing competency in this task?

    1. Content relevant to this task not taught under my direction
    2. One to 20 minutes of instruction
    3. Over 20 minutes and up to 1 hour of instruction

4. Over 1 hour and up to 3 hours of instruction
5. Over 3 hours and up to 6 hours of instruction
6. Over 6 hours and up to 12 hours of instruction
7. Over 12 hours of instruction

Respondent Follow-up

Follow-up telephone calls and letters were used to sample the nonrespondents and to clarify questions regarding the replies of those respondents who did not appropriately complete the Dental Task Inventory (DTI) questionnaire. A review of both the respondent response rate and the respondent completion rate for the DTI questionnaire is found in the following chapter under the section "Survey Instruments."

Methods Of Data Analysis

This study is considered as essentially exploratory and descriptive in nature. Generally the data collected were nominal, with some ordinal data gathered by the task inventory instrument. The raw data were coded for machine processing (see Appendix C) and punched into computer tabulation cards. The punched data were verified and cleaned to insure that each value punched was within the limits set for each variable.

Since the dental task statements were originally identified by observation of dental practice procedures and by a review panel of dental educators, their validity is assumed to be acceptable.

To examine the reliability (stability) of the respondent's responses to the long DTI questionnaire (563 task statements), a 10 percent (60 items) random sample of the task statements was selected for repetition and placed

randomly within the inventory. An analysis was made of stability of responses to each pair of statements using the following techniques.

First, the duplicate items were treated as pairs of scores and a product moment correlation was computed for each respondent. This approach was based on the fact that the DTI questionnaire required about three hours time for completion. Considering this time factor and the total of 623 (563 plus 60 duplicates) task statements in the questionnaire, the analysis was considered to be analogous to a test-retest (time-interval) (Gronlund, 1971, p. 108) reliability measure.

As a second technique, the duplicate items were analyzed, by paired items over all respondents, for exact agreements, i.e., 1-1, 2-2, 3-3, and 4-4 responses. The Faculty and Preceptors were treated as a group and as separate groups. This analysis applied a more stringent test to the responses than did the first technique and in addition allowed for an examination of those items with "poor" agreements.

Finally, the duplicate items were analyzed, by item and by Faculty and Preceptor groups, for three disagreement response patterns: (1) all combinations of disagreement to all possible responses, (2) all combinations of disagreement to all except 1-1 (Not taught under my direction) responses, and (3) each "do teach"-"do not teach" disagreement to all except 1-1 responses. This analysis provided the opportunity of examining those task statements with greater disagreements patterns and would, it was hoped, allow for an identification of problem areas in task statement construction and content.

Since the dental task statements were ordered randomly in the Dental Task Inventory questionnaire, it was necessary to categorize them, both for analysis and for preparing the feedback reports to the participating auxiliary education programs. While a number of classification categories had been utilized in

developing the task library, they were not considered appropriate for data analysis purposes. What was needed was a relatively small set of categories which could be hierarchically arranged, first by general type of work performed, and, second, by a small, but fairly encompassing number of procedures within each type of work.

To determine a set of categories which met the above criteria, a panel of two dentists, a dental assistant, and a dental hygienist was assembled. They identified the following 14 categories:

I. Business and Office Management
II. Housekeeping -- General and Clinical
III. Direct Patient Care (including laboratory work)
    1. Patient Care: Records -- Dental, Medical
    2. Patient Care: Examination -- Including Diagnostic Tests & X-rays
    3. Patient Care: Analysis, Treatment Planning, and Consultation
    4. Patient Care: Preventive and Patient Education
    5. Patient Care: Preparation
    6. Patient Care: Anesthesia and Medications
    7. Patient Care: Surgery and Surgically Related
    8. Patient Care: Impressions
    9. Patient Care: Dental Laboratory
    10. Patient Care: Insertions and Restorations
    11. Patient Care: Adjustments and Repairs
    12. Patient Care: Chairside Assisting and Clinical Support

Following the development of the categories, they were reviewed by the program directors of each of the participating dental auxiliary education programs, who commented on the suitability of the categories for determining the task content of their curriculum. The categories were accepted by the directors and the task statements were then organized accordingly. Of the 563 dental task statements, 383 fell into place easily, but there was some question as to where 180 of them should be placed. These were reviewed by two dental school educators; a dentist directing a dental hygiene education program; a dentist directing both a dental assisting and a dental hygiene education program; a dental hygienist (educator); and a dental assistant to determine into which categories they should be placed. Some of the statements were obviously

difficult to place as evidenced by the number of categories identified for some statements: 72 task statements were placed in a single category while 71 statements were placed in each of two categories, 31 statements were placed in 3 categories, and 6 statements were placed in 4 categories. A review of the responses indicated that a definition of each category would have helped the panel organize the statements. For some statements there was clearly a difference between what is and what is not chairside assisting dental tasks. The final decision of task placement among the categories was made based upon best judgement after reviewing the review panels responses.

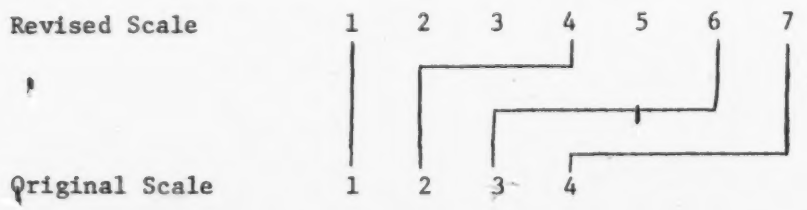
One-way frequency tables were produced for summarizing and reporting the responses to the task statement items in the DTI questionnaire. The first tables were prepared for each participating program and reported, by category and by respondent types, the frequency response to each level of responsibility for each dental task statement. Copies of these tables were provided to the directors of the respective participating dental auxiliary education programs. A second frequency table identified across programs, by category and by auxiliary, the Faculty responses to each level of responsibility for each task statement (see Appendix F). A copy of this table was also sent to each program director as the second half of each participating program's feedback report. A third one-way frequency table was produced which identified, by Faculty and by Preceptors, the highest responsibility level responses to each task within each category. This table was prepared across each participating site and across various combinations of participating sites (see Table G-1, Appendix G).

The data gathered through the DTI questionnaire should be of great value in identifying the similarities not only among various educational programs preparing students for a given auxili-ry role, but the data should also provide a means of assessing the similarities and differences among the three dental auxiliaries. In an attempt to make such comparisons, a hierarchical clustering

scheme (Johnson, 1967) was used to measure the extent to which each program is similar to every other program. Such an analysis will require again making explicit an assumption noted earlier in this paper: given the small number of Faculty identified in each auxiliary program and given the relatively small number of students admitted to each program, it was assumed that all students within a program are taught by every auxiliary Faculty member. It may be further assumed, therefore, that every student has been exposed to the expected outcomes of the program and that upon satisfactorily completing the program, the student will be able to perform to the level of those expected outcomes. It would follow, therefore, that if each respondent's responses were valid, a profile of the task content of the total curriculum and of the level of responsibility to which each task was taught may both be drawn and made complete to the extent that each Faculty member participated in the study and could respond to both the task statements and the response scales used in the DTI questionnaire.

To examine the profile of the task content of the curriculum, a composite response to the DTI questionnaire was produced. This was accomplished by using as the program response to any one task statement the highest level of responsibility assigned to the task by one or more members of the Faculty who reportedly taught that task.

It was assumed that the level of responsibility scale used for considering each task statement is not an equal interval scale, i.e., in terms of potential delegation or allocation of tasks or functions to an auxiliary the distance between levels 1 and 2, and 2 and 3 are meaningfully greater than the distance between 3 and 4. To express these differences, the original scale was arbitrarily modified using the following transformation model:



Using, then, the profile data set for each participating program, a new profile was generated using the revised scale. This transformation was performed to provide the Faculty response profile and to provide the Preceptor response profile, but the two respondent groups were not merged to form a single profile.

The hierarchical clustering scheme (HCS) of analysis is a technique used for partitioning objects (in this case, the profiles of dental auxiliary education programs) into optimally homogeneous groups on the basis of empirical measures of similarity among those objects. As Johnson (1967) notes, "Suitable data on the similarities among the objects . . . may be obtained directly or indirectly." For example, one may measure a number of attributes of the objects (in this case, the task content of the curriculum) and combine them to form a profile or single measure of similarity. "Various kinds of measures of profile similarity can be used for this purpose, (e.g., product moment correlation, covariance, or the sum of squared or absolute differences between corresponding components of the profiles) (Johnson, 1967)."

To apply the HCS model to this study, a symmetric matrix s was constructed, giving, for each of the pairings of dental auxiliary education programs a measure of their similarity, s(i,j), defined for a given pair of programs i and j by either

$$s(i,j) = \sum_{p=1}^{563} |x(i,p) - x(j,p)|$$

or

$$s(i,j) = \sum_{p=1}^{563} [x(i,p) - x(j,p)]^2$$

where x(k,p), (p=1,...,563), are the highest transformed responsibility responses to the 563 dental task statements for the kth program. In the latter matrix,

the sum of squared differences over the tasks will accentuate the differences among the programs and thereby possibly more sharply define the clustering developed by the sums of absolute differences matrix.

CHAPTER IV

ANALYSIS AND FINDINGS

Introduction And Overview

As was noted in the previous chapter, this study was conducted as a pilot study for developing methods suitable for studying the task content of accredited dental auxiliary education programs. Further, it was the intention of the study to develop a package of instruments which could be used, in the future, to relate the content of these educational programs to the delegation and allocation of dental and dental-related tasks in the world of dental care practice in such a way that a linkage could be made between educational preparation and work assignments on-the-job. To these ends, an instrument package was developed and tested in a study of nineteen dental auxiliary education programs in a midwestern state. The present chapter presents the analysis and finding of the study in four sections: (1) sample characteristics, (2) survey instruments, (3) biographical profiles, (4) dental task information.

Sample Characteristics

The population in this study consisted of the accredited dental assisting, dental hygiene, and dental laboratory technician education programs located in public and private post-secondary educational institutions in a midwestern state. Twenty-one programs were identified and contacted by telephone interviews (see Appendix B) with the program directors to determine their willingness to participate in the study. Table 1 identifies, by type of auxiliary, by level of educational completion, and by type of institutional setting in which the programs were situated, the nineteen programs investigated in this study. All programs, whether used in the study or not, were guaranteed anonymity;

therefore, it would be inappropriate to discuss the reasons why two schools chose not to participate in the study for to do so would likely identify them. Suffice it to say that each of the schools had internal situations which precluded their participation in spite of their willingness to become involved.

TABLE 1

DENTAL AUXILIARY EDUCATION STUDY SITES

AUXILIARY PROGRAM, COMPLETION AWARD	TYPE OF EDUCATIONAL SETTING: Community College & Technical Institute N	TYPE OF EDUCATIONAL SETTING: University with Dental School N	TOTAL	PERCENT
Dental Assistant				
Certificate	8	2	10	53
Dental Hygienist				
Certificate		1	1	5
Associate Degree	5		5	26
Baccalaureate		1	1	5
Dental Laboratory Technician				
Associate Degree	2		2	11
TOTAL	15	4	19	
PERCENT	79	21		100

On-site personal interviews were conducted with the program director of each of the participating auxiliary education programs. These interviews were designed to gather pertinent information regarding the program (see Appendix B) and to identify those members of the institutions' faculty who met the criteria

for service as Faculty respondents. In addition, consideration was given to the number of preceptors utilized by the program (if any) and decisions were made, based upon type of dental practice and geographic area, as to which preceptors would be sampled for Preceptor respondents.

TABLE 2

RESPONSE RATE TO DENTAL TASK INVENTORY
BY AUXILIARY AND BY RESPONDENT TYPE

AUXILIARY	IDENTIFIED FACULTY/ PRECEPTORS	DISTRIBUTED N	DISTRIBUTED %	RETURNED* N	RETURNED* %
Dental Assisting					
Faculty	49	49	100	49	100
Preceptors	214	164	77	105	64
Dental Hygiene					
Faculty	55	55	100	50	91
Preceptors	8	8	100	8	100
Dental Laboratory Technician					
Faculty	8	8	100	8	100
Preceptors	0				
TOTAL					
Faculty	112	112	100	107	96
Preceptors	222	172	77	113	66

*DTI questionnaires which were returned, complete or usable.

Survey Instruments

Response Rate

The study appeared to be welcomed by the program directors and Faculty. It was seen as a method of collecting certain information about their program

which, for various reasons, they had heretofore been unable to gather.

As was noted in the previous chapter, a 100 percent response rate was anticipated from the Faculty of each program. These expectations were met for the dental assisting and dental laboratory technician education programs. While only a 91 percent response was obtained from the dental hygiene Faculty, the five not responding were engaged less than full-time in dental hygiene education. One was a practicing dentist working only part-time on the Faculty and four were dental speciality educators in schools of dentistry who gave some lectures oriented to performing dental hygiene related tasks in the dental specialities which they represented. Follow-up interviews with the program directors at each of the three programs involved indicated that it was virtually certain that the tasks which would have been identified by these Faculty non-respondents would be identified (and to the same responsibility level) by other Faculty respondents. Considering these comments from the program directors, it was assumed that with 107 of 112 Faculty responding, an acceptable Faculty response rate had been received.

The Preceptors, not being as intimately identified with the auxiliary education program as were the Faculty, were not equally as interested in the study as were the Faculty. There was, however, a very prevalent attitude among the Preceptors interviewed of "wanting to be of help to the school and its auxiliary program." Many of the Preceptors expressed an interest in learning what their Preceptor colleagues were teaching as compared to themselves. While the overall Preceptor response rate (113 of 172, or 66 percent) was considerably less than that for the Faculty, the Preceptor response rate was greatly lowered by the effects of the response rate from two particular programs (see Table E-1, Appendix E).

In one dental assisting program, one of the Faculty respondents (an individual who shared the position of program director with another of the Faculty respondents) apparently "panicked" after reviewing the Dental Task Inventory (DTI) questionnaire. Evidently this individual had some reservations about the study being able to maintain the anonymity of the program's responses and, consequently, the "program director" called the program's Preceptors and requested that they not respond to the DTI questionnaires. Several Preceptors had already responded, but the remainder did not. Although the study staff finally gained the confidence of the "program director" (and received a DTI questionnaire response from the individual) the study staff did not attempt to recontact the Preceptors except to mail a follow-up letter to them (see Appendix I).

In the second dental assisting education program where the Preceptor response was very low, quite a different development took place. Shortly after the study staff had personally interviewed each of the Preceptors sampled and had received a commitment from them to participate in the study, the dentists in the area met in one of their regularly scheduled local dental association meetings. During the course of the meeting it was brought out that several dentists in the group had been asked to participate in the study. From what the study staff was able to learn later from talking with the dental assisting program director, the dentists decided during their meeting not to respond to the DTI questionnaire, not because of any embarrassment they wanted to bring upon the auxiliary education program, but because of the time it would take to respond to the instrument. As in the first case noted above, some Preceptors had already returned their DTI questionnaires and they were used in the study. No attempt was made, however, to recontact the remaining Preceptors from this dental assisting program.

If the two groups of preceptors noted above were discounted from the study, the Preceptor response rate for those remaining groups would be over 75 percent. This would indicate that the Preceptors, as a whole, were also quite interested in the study despite the length of the DTI questionnaire and the approximately three hours required to complete it.

Dental Task Inventory Questionnaire Completion Rate

The completion rate for the 220 DTI questionnaires returned is noted in Table 3 (see Table E-4, Appendix E for detail). Completion rates were calculated as the percent of items completed by respondents, except the time scales (which were later discarded as unreliable, and probably invalid). (See following section of this chapter.) These completion rates of over 99 percent of all task

TABLE 3

COMPLETION RATE OF DENTAL TASK INVENTORY BY DENTAL AUXILIARY AND BY FACULTY AND PRECEPTOR RESPONDENTS

DENTAL AUXILIARY EDUCATION PROGRAM	FACULTY N	COMPLETION %*	PRECEPTORS N	COMPLETION %
Dental Assisting	49	99.6	105	98.2
Dental Hygiene	50	99.6	8	99.9
Dental Laboratory Technician	8	99.3		
TOTAL	107	99.6	113	98.3

*Mean percent of dental task statement items responded to in DTI questionnaire, except time scales.

statements for the Faculty and of over 98 percent for the Preceptors were achieved with a minimum of follow-up to those respondents who had not entirely completed the DTI questionnaire at the time it was first received from the respondent. In several cases, Faculty as well as Preceptors, the respondents had not completed one or more pages of the DTI instrument, whereupon a letter and copies of those pages not completed were returned to the respondent along with the instrument's pages of instruction, definitions, and task inventory questions and response scales (see Appendix I for letters to respondents). While only three respondents never did complete the omitted pages, their original questionnaires, partially complete, were placed in the data bank for their respective programs.

Considering both the response rates and the completion rates of the Faculty and the Preceptors to the DTI questionnaire, it again may be assumed that despite the number of items in the instrument and the time required for its completion, the respondents were quite interested in the study being conducted and in the feedback reports to be returned to their respective programs. It should be noted that in the case of several Faculty members and Preceptors, where either or both were teaching in two different programs, they were asked to complete a DTI questionnaire for each program in which they participated. In every case where such a request was made, two instruments were received from each respondent.

Response Reliability

The DTI questionnaire consisted of two sections: (a) a biographical data section used to identify certain biographical characteristics of the Faculty and Preceptors, and (b) the dental task inventory portion designed to gather information regarding the dental and dental-related task content of the auxiliary

program's curriculum - including the responsibility levels to which the tasks are taught and the cumulative time devoted to teaching each task. As will be noted from a review of Appendix A, each of these sections was fairly sizable and taken together required up to three or more nours to complete. It was considered desireable, therefore, to obtain a measure of respondent consistency (stability) as a necessary condition for considering the validity of the study's findings as taken from the DTI questionnaire. This was done by inserting 60 duplicate items at random among the 563 dental task statements.

To assess the stability of each respondent's responses to the DTI questionnaire, two types of analysis were made of the responses. In the first analysis, a two-way frequency table was prepared which identified, by number of paired responses (excluding paired nonresponses) and by percent of exact agreements, the number of respondents in each stability level. Table 4 reveals that 163 respondents (73 percent) made identical responses, i.e., 1-1 ("Task not taught under my direction"), 2-2 ("Student will be able to perform task but only under direct supervision"), 3-3 ("Student will be able to perform task with shared responsibility"), 4-4 ("Student will be able to perform task with independent responsibility"), to both items and responded to no less than 95 percent of the duplicate pairs. One hundred and seventy-three respondents (79 percent) made identical responses to at least 86 percent of the duplicate pairs regardless of the number of pairs to which they responded. Of the 47 respondents with fewer than 86 percent exact agreements, the Preceptors accounted for 81 percent of the total. As a proportion of all Preceptors, 34 percent of the Preceptors had less than 86 percent exact agreements while the proportion of Faculty with less than 86 percent exact agreements was only eight percent.

These findings of respondent consistency would indicate that the dental auxiliary educators were not only able to identify dental task statements as

TABLE 4

CONSISTENCY (STABILITY) OF FACULTY AND PRECEPTOR RESPONSES TO SIXTY DUPLICATE STATEMENTS IN DENTAL TASK INVENTORY QUESTIONNAIRE

NUMBER OF DUPLICATE TASK STATEMENTS RESPONDED TO	PERCENT EXACT AGREEMENTS 100-96 N	95-91 N	90-86 N	85-81 N	80-76 N	75-71 N	Less Than 70 N	TOTAL N	TOTAL %
59-60	74	46	29	14	11	7	4	185	84
57-58	6	4	4	7	1			22	10
55-56	2		1		1			5	2
53-54	1	1						2	1
51-52	2			1				3	1
Less than 50	2					1		3	1
TOTAL N	87	52	34	22	13	8	4	220	
TOTAL %	40	24	15	10	6	4	2		100*

*Percent does not add to 100 due to rounding.

part of the task content of the curriculum, but they also were able to consistently identify the level to which the dental task was taught. While the Faculty were more consistent in their responses than were the Preceptors, this difference may be a function of the Preceptor's inability to generalize from that which he or she teaches a given student in a few weeks to that which he may teach another student during another period.

In a further study of each respondent's consistency of response to the pairs of duplicate task statements, a correlation coefficient was computed for

each respondent (see previous chapter). Each pair of scores for which each respondent responded were treated as x and y scores to be correlated to produce a "stability coefficient." Although the correlation was computed on sixty pairs of scores each score of which could have a value from one through four, the results of the correlation were spurious, e.g., one respondent with a 97 percent exact agreement to sixty duplicate pairs yielded a stability coefficient of .981 while another respondent with a 92 percent exact agreement to sixty pairs of statements yielded a stability coefficient of only .187. These findings led to the conclusion that the stability coefficient was not an effective indicator due to the large number of "1-1" agreements among the pairs of statements. This condition effectively reduced the number of items in the correlation and at the same time reduced the variance sufficiently to make the correlation unusable.

An examination of Table 5 indicates that of those Faculty and Preceptors responding to each duplicate pair of dental task statements, no single pair of statements received less than 152 (73 percent) exact agreements while one task had 216 (99 percent) exact agreements. On the average, each pair of dental task statements received 197 exact agreement responses (90 percent of the total responses). Such a high percent of exact agreements per pair of task statements was, of course, expected after a review of Table 4; however, this did not answer why the respondent "stability coefficient" produced spurious results.

To further examine the exact agreements, a study was made of each task statement to determine the frequency of each kind of exact agreement, i.e., 1-1, 2-2, 3-3, 4-4. Table 5 reveals that for the Faculty respondents, as many as 98 percent of their exact agreements to a single item were "1-1" responses ("Not taught under my direction"), and for the Preceptors as few as seven percent

TABLE 5

STABILITY OF FACULTY AND PRECEPTOR RESPONSES

TO DUPLICATE DENTAL TASK ITEMS*

TASK ITEM NO.	TOTAL** RESPONDENTS N	EXACT AGREEMENT 1-1,2-2 3-3,4-4 FAC + PRE %	1-1 FAC %	1-1 PRE %	DISAGREEMENT RESPONSE PATTERNS*** 1 FAC %	1 PRE %	2 FAC %	2 PRE %	3 FAC %	3 PRE %
1001	218	98	98	96	1	3	50	40	50	60
1002	218	95	97	71	0	9	0	13	0	31
1003	216	93	91	84	5	6	50	22	50	56
1004	215	92	65	86	7	9	5	27	19	67
1005	215	85	57	67	11	19	22	31	27	58
1006	216	87	93	63	4	23	38	20	50	63
1007	219	99	96	94	0	3	0	0	0	43
1008	217	89	80	57	5	16	10	15	24	38
1009	218	95	91	91	7	5	40	10	70	50
1010	218	95	87	87	5	5	21	20	36	33
1011	219	93	84	76	6	9	18	11	35	37
1012	213	93	83	68	5	10	11	6	28	31
1013	216	94	87	95	9	3	57	20	71	60
1014	215	94	90	83	5	8	46	11	46	47
1015	218	97	91	93	3	4	10	25	30	50
1016	212	81	73	62	15	23	41	25	55	60
1017	212	81	57	34	14	25	30	6	33	37
1018	217	91	78	71	5	13	8	19	21	44
1019	214	100	98	100	0	0	0	0	0	0
1020	216	91	77	71	4	15	12	13	16	50
1021	216	98	95	95	1	3	0	0	20	50
1022	216	86	77	79	13	15	38	0	58	70
1023	219	90	78	75	6	15	21	14	25	61
1024	215	94	92	93	7	5	44	0	78	53
1025	216	84	79	56	9	23	27	2	46	52
1026	215	91	82	75	6	13	26	19	32	52
1027	217	89	74	72	5	16	14	16	18	58
1028	218	92	90	88	7	9	64	15	64	77
1029	219	95	80	89	8	4	24	8	38	33
1030	218	97	93	96	4	2	50	0	50	50
1031	218	97	93	88	1	5	13	15	13	39
1032	217	93	87	72	4	10	0	10	29	36
1033	216	94	71	79	7	6	10	13	23	26
1034	217	97	88	95	4	3	15	0	31	50
1035	216	89	73	29	7	16	10	5	24	22
1036	218	99	97	97	1	2	33	0	33	67
1037	218	91	89	87	7	12	50	60	58	87
1038	217	89	66	78	10	12	12	17	32	54
1039	217	95	91	89	3	6	30	33	30	58
1040	216	78	72	30	12	32	30	9	43	46
1041	214	74	53	38	21	32	26	18	44	52
1042	213	93	84	47	3	10	6	0	18	20
1043	217	86	51	19	5	23	10	11	10	28
1044	218	84	82	39	7	25	26	13	37	41
1045	212	88	50	7	11	13	19	1	23	14
1046	215	92	65	83	10	6	8	16	30	37
1047	216	89	68	50	4	17	6	15	12	35
1048	218	91	82	75	5	14	11	32	26	54
1049	218	94	94	87	3	9	33	13	50	67
1050	218	97	86	94	3	4	20	14	20	57
1051	218	96	97	93	1	7	33	38	33	100
1052	216	92	71	21	4	12	10	6	13	15
1053	216	88	72	73	9	16	13	24	33	59
1054	214	79	76	51	13	28	23	15	54	57
1055	215	94	96	84	2	11	50	28	50	67
1056	215	88	86	83	10	13	47	6	73	75
1057	209	73	47	42	19	35	18	24	35	61
1148	214	92	70	62	6	10	9	5	19	27
1306	217	89	72	69	6	17	7	31	20	54
1355	218	97	94	93	2	4	17	13	33	50

* See Appendix D for task statements.

** Total potential respondents: 220; Faculty: 107; Preceptors: 117.

*** Pattern 1: (1-2,1-3,1-4,2-3,2-4,3-4)/(1-1,2-2,3-3,4-4,1-2,1-3,1-4,2-3,2-4,3-4)
Pattern 2: (1-2,1-3,1-4)/(2-2,3-3,4-4,1-2,1-3,1-4,2-3,2-4,3-4)
Pattern 3: (1-2,1-3,1-4,2-3,2-4,3-4)/(2-2,3-3,4-4,1-2,1-3,1-4,2-3,2-4,3-4)

of their exact agreements were "1-1" for a single statement. The mean "1-1" response rate among exact agreements was 81 and 72 percent for the Faculty and Preceptors respectively. This high percent of 1-1 agreements, then, was apparently the factor which effectively reduced the value of the "stability coefficient" as an efficient measure of each respondent's consistency. To be able to use the "stability coefficient" as an effective measure, it appears that a group of task statements must be selected which tend to be taught and to be taught to various levels.

To return to the general considerations of response reliability (stability), it would appear that if the percent exact agreement responses to all duplicate task statements were considered, it would have to be concluded that the responses to the task statements were very consistent (stable). But what of the consistency of response to those duplicate task statements which were reported to be taught at least once in each pair of task statements?

To examine the above question, several analyses were conducted to identify certain types of disagreement response patterns which might exist in the data. In the first analysis, the question was asked, "What percent of all the paired responses to the duplicate items were other than exact agreements?" The results of this analysis are noted in response pattern 1 of Table 5. An example from the table will illustrate how disagreement response pattern 1 is read. For task item 1001, it is first noted that 98 percent of all Faculty responses were "1-1" agreements. Of the other two percent of their responses, what percent were some type of disagreement? Disagreement response pattern 1 indicates that only one percent were disagreements. It was evident from this finding that there were few disagreements for the majority of the Faculty respondents. But, if the "1-1" responses were removed from the analysis, then what percent of the paired responses to the duplicate items were other than exact agreements?

Disagreement pattern 3 in Table 5 indicates the findings of this analysis. It answers the question, "Where the respondents had decided at least once in each pair of responses that they do teach the item, what percent of their responses were disagreements?" Again using a task item for illustration, it was noted for item number 1035 that the Faculty had less difficulty making a stable response than did the Preceptors. Although the Faculty did have a 24 percent disagreement rate to this item, as compared with a 22 percent rate for the Preceptors, the Faculty generally had less difficulty making a stable response than did the Preceptors. This particular analysis, however, did not indicate if the respondents were having difficulty deciding between whether they "did teach or didn't teach" the task or whether the problem was "To what level do I teach it?"

Disagreement response pattern 2 of Table 5 addresses itself to the above question. This analysis addressed the question, "Considering only the items to which the respondents did respond with a 'do teach' in at least one response of each pair of responsibility responses, what percent of the paired responses were of the type 'don't teach - do teach?'; i.e.; '1-2,' '1-3,' '1-4.'" The data in pattern 2 indicate the Faculty and the Preceptors had less trouble with this type of uncertainty (instability) than they did with the "to which level do I teach it?" problem. For task item number 1355, for example, only seventeen percent of the Faculty responses were of the type "do teach - don't teach." The corollary of this finding was that 83 percent of the Faculty responses to the item showed they had trouble answering the question, "To what level do I teach it?" The Preceptors in this analysis had less trouble than the Faculty with the "do teach - don't teach" problem; i.e., in only twenty of the items (33 percent) did the Preceptor response rate exceed that of the Faculty.

To summarize the findings presented in disagreement response patterns 2 and 3 of Table 5, the Preceptors exhibited less stability than the Faculty

given they had marked one task statement pair with a "do teach" response, but their instability was more likely than was the Faculty's to be of the type, "To what level do I teach it?"

Validity

The reliability studies presented in the previous section indicate there was sufficient respondent consistency (stability) to make a case for the further development of the instruments' validity; i.e., the validity of the Faculty and Preceptor response to the DTI questionnaire.

Dental Task Inventory

As was reported in the previous chapter, the dental task statements utilized in the Dental Task Inventory were derived from dental tasks, functions, and procedures statements identified in dental job analysis studies reported in the literature and from a panel of dentists (educators) and dental auxiliary personnel who worked together with the study staff to prepare an inventory of dental tasks statements relevant to the objectives of this study. It was assumed, therefore, that the inventory has a considerable degree of content validity. It apparently also has considerable face validity judging from discussions of the DTI questionnaire with each of the respondents at the time the instruments were distributed. In addition, in discussions with several of the respondents and program directors following the survey there were few comments made relevant to challenging the content of the inventory - except that it was very long. There were two or three comments made relevant to a few of the compound statements, i.e., those constructed with slashes (/) to indicate tasks which were considered to usually be performed as part of a series. Otherwise, there was little to suggest that the Dental Task Inventory's content was not

considered as a valid representation of tasks taken from the world of dental care work and from the content material of dental auxiliary curricula.

In a study designed to identify those dental tasks being performed by various dental personnel actually delivering dental care services, Dr. Marvin Marcus of the School of Dentistry at the University of California at Los Angeles, California, is using a Patient Contact Record form and a Dental Task Inventory questionnaire for collecting data. The dental task statements in Dr. Marcus' DTI questionnaire were developed jointly by his staff and this study and thus the two studies share a common data collection instrument. In addition, Dr. Marcus' Patient Contact Record form, which lists 269 dental tasks from which dental personnel may select those tasks they perform day by day in the delivery of their services, lists 152 task statements which are duplicates of the dental task statements found in the DTI questionnaire developed jointly by the two studies. An additional 135 dental task statements from the DTI questionnaire may be identified with two or more of the remaining 117 dental tasks identified on the Patient Contact Record form. In personal communications with Dr. Marcus, it has been learned that he is experiencing little or no difficulty with the dental tasks listed on the Patient Contact Record and that except for the length of the DTI questionnaire, and the difficulties of trying to get individuals to respond to both data collection instruments, his study has not identified any serious problems with the dental task statements as they are responded to by practicing dentists and dental auxiliaries. This information suggests additional weight may be given to the content validity of the Dental Task Inventory used in this study.

Responsibility Levels

The comments received from Faculty and Preceptor respondents related to

the scale used for the responsibility levels to which dental tasks were taught indicated that the levels were both understandable and usable. These findings were similar to those of Tomlinson (1969, p. 120), from whom this study's scales were adapted, who found that licensed practical nurses, their supervisors, and nurse educators could respond to 99 identified tasks performed by LPNs and give meaningful reasons and explanations of their decisions regarding the option selected on the responsibility response scale.

There was, as was noted in the previous section of this chapter (see Table 5), some difficulty on the part of the Preceptors to maintain as much consistency as the Faculty to duplicate task statements using the scale, but this difficulty was apparently not so much related to the scale as it was to context in which the Preceptor found himself when responding. Many of the Preceptors reported some difficulty in responding to what they teach because of the short period of time which each student spends with them, and because of the variation among the students and their individual capabilities and attitudes. Notwithstanding this problem, the Preceptors did not indicate they had trouble with the scale *per se*.

Instructional Time

The second question used with the Dental Task Inventory - "How many of the organized hours of instruction in the courses/labs/clinics taught by you or under your direct responsibility are devoted to developing competency in this task?" - was found to be a very poor question for obtaining any degree of reliable response; hence, the validity is surely low as well. The problem became very apparent when it was noted that many of the Faculty and a great majority of the Preceptors stopped answering the question after completing the first few pages of the DTI questionnaire. In follow-up interviews with the

respondents it was learned that it was very difficult for them to (a) remember or determine how much time was spent teaching each task or part of a task on each occasion it was taught, (b) remember or determine on how many occasions the task or part of a task was taught, and (c) accumulate the time, especially for those tasks which are closely related to more than one type of dental procedure. The problem of recall was heightened for those Faculty teaching in programs with two and four year academic curricula and for those Faculty teaching in more than one auxiliary education program. The Preceptors were especially reticent in responding to the question for several reasons. First, they expose any one auxiliary student to only those dental tasks performed in the dental practice during the period of time in which the student is assigned there. Consequently, depending upon the flow of patients at any given time, each student may encounter different teaching opportunities. The problem is further complicated for the Preceptor by the types of student assigned to work under his or her tutelage; e.g., some students with a good deal of self-confidence and initiative are allowed to do more than students who may be less confident and shy. As a result of these findings, the study did not further analyze the data collected by this question.

In a final note on the validity of the responses to the DTI questionnaire, an interesting point regarding the accuracy of the responses is noted on Table 5. Another look at the "1-1" exact agreements for the Faculty and for the Preceptors indicates that for the statements selected as duplicate items for the DTI questionnaire, the Preceptors, on the whole, tended to teach more of the tasks than did the Faculty. This difference is meaningful in view of the selection process used for identifying the Faculty respondents.

It was noted in the previous chapter that the "Faculty" respondents were selected on the basis of whether they were identified by the auxiliary education

program directors as having as a primary responsibility the teaching of dental or dental-related tasks. This definition, it will be recalled, excluded those institutional faculty members teaching business and office management courses to the dental auxiliaries except in cases where a specific section of a course was designed specifically for dental auxiliary students. Given this limitation, only one dental auxiliary education program could identify a business and office management teacher who would qualify as a Faculty respondent. Many of the auxiliary education curricula included business and office management courses, but the institutional faculty member(s) teaching the courses did not meet the definition for a Faculty respondent.

In view of the above limitation, it would be expected that only a small proportion of dental tasks taught, as reported by the Faculty, would come from the category of "Business and Office Management"; i.e., if the Faculty were accurate in their responses, one would expect to find fewer tasks identified as being taught, or taught to a high level of responsibility, in this category. It is meaningful to note, therefore, that among the thirteen duplicate task statements in the "1-1" exact agreement columns of Table 5 wherein there is a twenty percent or greater discrepancy between the Faculty and Preceptors in favor of the Preceptors teaching the tasks, ten of the thirteen dental tasks (77 percent) fall in the category of "Business and Office Management." These findings tend to indicate that the Faculty were not, in at least this category of dental tasks, over-stating their teaching roles.

Institutional And Faculty Characteristics

Two instruments were designed to identify a number of auxiliary programs and auxiliary personnel characteristics which serve as dependent variables. The following section includes a discussion of a number of those characteristics.

Institutional And Program Characteristics

As Table 1 indicates, nineteen accredited dental auxiliary education programs were included in the study. Among the nineteen programs were ten dental assisting programs, seven dental hygiene programs, and two dental laboratory technician programs. Each of the dental assisting programs offered certificates of completion to those satisfactorily completing the courses of study which ranged from thirty to forty weeks in length (33 weeks mean). Both of the dental laboratory technician programs offered the Associate degree upon completion of the 72 and 76 weeks courses. The dental hygiene programs included six "two-year" academic programs and one "four-year" Baccalaureate degree program. The former six programs ranged in length from sixty to eighty weeks (70 weeks mean); five offered the Associate degree and one a certificate upon satisfactory completion of the programs.

Table 6 identifies the entrance requirements for acceptance into the three auxiliary education programs. A high school diploma or equivalent was required by all programs as was the dental hygiene aptitude test in all dental hygiene programs. In general, however, most of the dental auxiliary programs appeared to be reflecting that while a number of requirements may be listed for completing an application, it would be difficult to rank order them or even to say that each of the components was used in the process of selecting every member of every class. The dental hygiene programs did, however, appear to be most selective in their admission of students.

Table 7 indicates that regardless of the size of the criterion class, each of the three types of dental auxiliary education programs had had a relatively small student - Faculty ratio (number of students per identified full- and part-time Faculty). The mean student-Faculty ratio for the dental hygiene programs tended to be lowered by the small class size of the Baccalaureate

TABLE 6

ENTRANCE REQUIREMENTS FOR DENTAL AUXILIARY EDUCATION PROGRAMS

REQUIREMENTS	DENTAL AUXILIARY PROGRAMS					
	D. Assisting N=10		D. Hygiene N=7		D. Laboratory Technician N=2	
	N	%	N	%	N	%
High school diploma or equivalent	10	100	7	100	2	100
High school rank or grades	6	60	4	57	0	0
American College Testing Program (ACT)	8	80	5	71	2	100
Personal interview(s)	5	50	5	71	0	0
Letters of recommendation	2	20	3	43	0	0
Specific high school course requirements	1	10	1	14	0	0
Aptitude test(s)	1	10	7	100	0	0
Physical examination	1	10	2	30	0	0
Test for color-blindness	0	0	0	0	1	50
Typing Skills	1	10	0	0	0	0
Complete open door policy	1	0	0	0	0	0

degree program which was graduating its first class of students. Those auxiliary programs offered in institutions with schools of dentistry tended to have smaller student-Faculty ratios due to the immediate availability of the large number of dental school faculty members who are used as part-time Faculty members and as guest lecturers in the auxiliary education program.

Except in the case of the one Baccalaureate dental hygiene program, each of the various auxiliary education programs had graduated at least three previous classes of students. One dental assisting program was graduating its 27th class and one dental hygiene program was graduating its 51st class. The median

TABLE 7

CRITERION CLASS ENROLLMENTS, EXPECTED COMPLETION, AND STUDENT-FACULTY RATIOS FOR DENTAL AUXILIARY EDUCATION PROGRAMS

	DENTAL AUXILIARY PROGRAMS		
	D. Assisting	D. Hygiene	D. Laboratory Technician
Criterion Class Enrollment			
Mean	28	32	27
Median	24	30	24
Range	21-42	14-42	24-30
Expected Completions			
Mean	24	27	27
Median	22	28	19
Range	14-39	14-36	19-34
Student-Faculty ratio*			
Mean	6.5	4.9	6.7
Median	4.2	4.1	6.4
Range	3.0-10.7	1.2-7.8	6.4-7.0

*Number of students per identified full- and part-time Faculty.

number of classes graduated was 5.5 and 3.5 for dental assisting and dental hygiene, respectively. One dental laboratory technician program had graduated two previous classes while the other had graduated thirteen previous classes.

A most interesting piece of data was that dealing with the use of advisory councils by the auxiliary education programs. While all of the programs in community colleges and technical institutes had an advisory council of practicing dentists, Faculty, and lay members of the community, only one of the auxiliary programs located in a school of dentistry had one, and its advisory council had just been formed. The directors of those programs without advisory councils indicated that they did not have anything equivalent to an outside advisory

council with which they could confer or which could review the program's curriculum, and make suggestions for change. It is only fair to point out, however, that those programs with advisory councils reported a varying degree of success with their councils, notwithstanding that each of them had met at least once in the past year.

While nine of the ten dental assisting education programs utilized the services of dental Preceptors during the course of the academic program, only two of the seven dental hygiene programs utilized Preceptors. Neither of the two dental laboratory technician education programs made use of a Preceptor. In the case of the dental hygiene education programs, the state's Dental Practice Act precludes the student from performing certain dental services beyond the physical setting of the institution's own clinic(s), except as the student may work in military or other federal government sponsored clinics or hospitals not covered by the state's Act.

Nine of the ten dental assisting programs utilized Preceptors, but all ten of the programs exposed the students to one or more types of dental clinics (Table 8). In four of the dental assisting programs each student was exposed to every type of clinical setting used in the curriculum while in the other six programs, although the students were rotated among the Preceptors, every student did not have an educational experience in each type of clinical setting. Among the dental hygiene programs, two programs exposed the students to various types of clinical settings through the use of military hospitals and clinics while two additional dental hygiene programs used the clinics available within their institutional settings. In one of the dental laboratory technician education programs the students were given some educational experiences in commercial dental laboratories but always under the immediate supervision of the program's Faculty.

TABLE 8

TYPES OF DENTAL CLINICS AND SPECIALITIES IN WHICH DENTAL AUXILIARY STUDENTS ARE PLACED FOR FACULTY AND/OR PRECEPTOR TUTELAGE

TYPE OF CLINIC OR SPECIALITY	DENTAL AUXILIARY EDUCATION PROGRAM					
	D. Assisting N=10		D. Hygiene N=7		D. Laboratory Technician N=2	
	N	%	N	%	N	%
1. General dentistry clinic or practice not in a dental or auxiliary school.	9	90	2	29		
2. Periodontic clinic/ office	5	50	3	43		
3. Prosthodontic clinic/ office	3	30	3	43		
4. Orthodontic clinic/ office	10	100	2	29		
5. Endodontic clinic/ office	4	40	3	43		
6. Pedodontic clinic/ office	7	70	2	29		
7. Oral surgery clinic/ office	9	90	2	29		
8. General dentistry clinic in a dental school (not in an auxiliary school clinic)	1	10	1	14		
9. Clinic within the teaching institution and considered unique to the auxiliary education program(s) in question			7	100	2	100
10. Dental public health clinic/office	1	10	1	14		
11. Commercial dental prosthetics laboratory	5	50			1	50
12. Military or veterans dental clinic	1	10	2	29		
13. Nursing Home			1	14		

Faculty Characteristics

From several analyses made of the personal characteristics of the Faculty, it appeared that for both the dental assisting and dental hygiene education programs there were two types of preparation within the Faculty - the dentists and those prepared as one or more of the dental auxiliaries. (see Table 11). The dentists were, except for one, all males and were, as a rule, over 35 years of age. They tended to be married, and a few of them were other than white Caucasians. Except for five of the seventeen programs which had dentists employed as full-time administrative directors, the majority of the dentists on the Faculty could be classified as part-time instructors and as part-time supervising dentists to the programs. In those programs located in schools of dentistry, there tended to be more dentists identified as Faculty (Table 11) although they held "full-time" appointments in the school of dentistry.

In the auxiliary group of the Faculty in the dental assisting and dental hygiene programs, the auxiliaries were all females and tended to be in the 20 to 35 year age category with some clustering around 24-25 years of age. There were many among them who had never been married, and there were no race or ethnic groups other than white, Caucasian found among them. Except for a few cases, they were full-time employees of the educational institutions and they accounted for a majority of the instructional hours produced by the programs' curriculum.

As Table 9 indicates, the dental laboratory technician Faculty were males and all, except for one dentist, were dental laboratory technicians. Although the number of Faculty in this dental auxiliary study was small, here again there was a large number in the 20-35 years of age category and there were only white, Caucasians among the group.

TABLE 9

BIOGRAPHICAL DATA OF FACULTY IN NINETEEN DENTAL AUXILIARY EDUCATION PROGRAMS

DENTAL AUXILIARY PROGRAMS BY INSTITUTIONAL SETTING AND BY EDUCATIONAL COMPLETION LEVEL	FACULTY	AGE TO NEAREST BIRTHDAY			SEX		RACE				MARITAL STATUS		
	N	20-35 %	36-50 %	OVER 50 %	M %	F %	WHITE %	AMERICAN INDIAN %	ORIENTAL %	OTHER %	NEVER MARRIED %	NOW MARRIED %	OTHER %
DENTAL ASSISTING													
Community College Certificate	31	55	32	13	26	74	97	3	0	0	19	61	19
Dental School Certificate	18	55	39	6	39	61	94	0	6	0	28	67	6
All Programs	49	55	35	10	31	69	96	2	2	0	22	63	14
DENTAL HYGIENE													
Community College & Technical Institute Associate	28	68	14	18	25	75	96	0	4	0	21	68	11
Dental School Certificate	10	90	10	0	50	50	100	0	0	0	30	70	0
Baccalaureate	12	50	42	8	50	50	92	0	8	0	25	75	0
All Programs	50	68	20	12	36	64	96	0	4	0	24	70	6
DENTAL LABORATORY TECHNICIAN													
Community College & Technical Institute	8	63	12	25	100	0	100	0	0	0	0	88	12
ALL DENTAL AUXILIARY PROGRAMS*	107	62	26	12	38	62	96	1	3	0	22	68	10

*Percents may not add to 100 due to rounding.

With such a large percentage of the Faculty in the 20 to 35 years of age category, several questions are raised which relate to the extent of the Faculty's professional experiences. From Table 10 it would appear that the Faculty in each of the three types of auxiliary education programs were about proportionately distributed among the three levels of years since completing primary dental occupational education, although the proportions for the dental hygiene programs located in dental schools is fairly unique. These latter figures are reflective of one dental hygiene program where eight of ten Faculty had completed their professional education within the past three years and apparently continued on into teaching. If the auxiliaries group of the Faculty is considered apart from the dentist group, the findings for the auxiliaries Faculties move decidedly towards the "zero to five years since completing primary dental occupation education."

The faculty, as a whole, have not had many years of professional work experience other than in their current job title (Table 10). Over fifty percent of all Faculty have had five years or less. This is partially due to the extended education period required for the dentists which, when taken with their young ages, does not allow for many years of professional experience. Again, if the auxiliary Faculty is considered as a group apart from the dentist Faculty, 72 percent of the auxiliary Faculty have had five years or less professional work experience outside their current job title and nineteen percent have had over five and up to ten years professional work experience outside their current job title. This may suggest that a number of the auxiliary Faculty go directly into teaching upon completing their dental occupational education.

Over 91 percent of all Faculty have worked five years or less in their current job title in the specific auxiliary education program in which they

TABLE 10

EDUCATIONAL AND PROFESSIONAL WORK EXPERIENCE BACKGROUNDS

OF FACULTY IN DENTAL AUXILIARY EDUCATION PROGRAMS

AUXILIARY PROGRAM BY INSTITUTIONAL SETTING	FACULTY	YRS. SINCE PRIMARY DENTAL OCCUPATION EDUCATION COMPLETED			YRS. PROFESSIONAL WORK OTHER THAN CURRENT JOB TITLE			FACULTY	YRS. WORKED IN CURRENT PROGRAM IN CURRENT JOB TITLE		
		0-5	Over 5 & Up To 10	Over 10	0-5	Over 5 & Up To 10	Over 10		0-5	Over 5 & Up To 10	Over 10
	N	%	%	%	%	%	%	N	%	%	%
Dental Assisting											
Community College	26	31	31	38	46	23	31	31	94	6	0
Dental School	17	41	29	29	53	24	24	18	94	0	6
All Programs	43	35	30	35	49	23	28	49	94	4	2
Dental Hygiene											
C. C. & Technical Institute	27	37	33	30	41	33	26	28	86	14	0
Dental School	21	67	19	14	67	24	9	22	95	5	0
All Programs	48	46	31	23	52	29	19	50	90	10	0
Dental Laboratory Technician											
C. C. & Technical Institute	8	38	38	25	75	13	13	8	75	12	12
All Auxiliaries*	99	40	31	28	53	25	22	107	91	7	2

*Percents may not add to 100 due to rounding.

are currently employed (Table 10). In fact, 94 percent of all dental assisting Faculty and 95 percent of the dental hygiene Faculty located in schools of dentistry have five or fewer years of experience in their current job titles. These figures appear to be high even when it is known that 47 percent of the nineteen auxiliary education programs in the study have been in existence no more than five years.

Table 11 identifies by dental auxiliary education program the areas of primary dental or dental-related speciality education among the 107 Faculty respondents in the study. The dental assistant and dental hygiene programs located in schools of dentistry have a notably greater proportion of dentists on the Faculty than do the same auxiliary programs located in community colleges and technical institutes. These figures may be somewhat misleading for the dental assisting programs located in community colleges, since, in these locations where a practicing dentist was identified as a "guest lecturer" type Faculty member and as a Preceptor, the dentist was asked to respond as a Preceptor. Because there was not a response from two dental assistants teaching in the Baccalaureate level dental hygiene program, two dental assistants should be added to the table to give a more complete profile of the Baccalaureate Faculty. Finally, those Faculty in the "other than dental-medical" category of dental-related specialties were microbology, physiology, typing, and business and office management teachers who met the definition of a Faculty respondent.

In an effort to determine how much "inbreeding" there may be among the Faculty in the auxiliary education programs the question was raised regarding the state in which Faculty had received primary dental occupational education. Sixty-two percent of all Faculty received their primary dental occupational education in the state in which they were teaching. The auxiliary prepared Faculty was about evenly divided between those having received their education in the state in which they were teaching and other states while among the

TABLE 11

PRIMARY SPECIALTY OF FACULTY IN NINETEEN SELECTED

DENTAL AUXILIARY EDUCATION PROGRAMS

DENTAL OR DENTAL-RELATED OCCUPATIONAL SPECIALTY	DENTAL ASSISTING				DENTAL HYGIENE						DENTAL LABORATORY TECHNICIAN		ALL AUXILIARIES	
	C, CC* (8 Programs)		C, DS (2 Programs)		A, CC (5 Programs)		C, DS (1 Program)		B, DS (1 Program)		A, CC (2 Programs)		(19 Programs)	
	N	%	N	%	N	%	N	%	N	%	N	%	N	%
Dentist, General	6	19	3	17	7	25			1	8	1	13	18	17
Orthodontist			1	6			1	10					2	2
Endodontist	1	3					1	10					2	2
Pedodonist			1	6	1	4	1	10					3	3
Periodondist							1	10					1	1
Operative Dentistry							1	10	2	17			3	3
Dental Radiologist			1	6					1	8			2	2
All Dentists	7	23	6	33	8	29	5	50	6	50	1	13	33	31
Dental Assistant	15	48	6	33									21	20
Dental Hygienist	6	19	4	22	20	71	4	40	6	50			40	37
Dental Laboratory Technician			1	6							7	87	8	7
Registered Nurse							1	10					1	1
Radiologic Technologist			1	6									1	1
Other than Dental-Medical	3	10							2	17			5	5
TOTAL**	31	100	18	100	28	100	10	100	12	100	8	100	107	100

*Auxiliary program by education completion level and institutional setting: (C, CC) Certificate, Community College; (C, DS) Certificate Dental School; (A, CC) Associate Degree, Community College and Technical Institute; (B, DS) Baccalaureate Degree, Dental School.

**Percents may not total to 100 due to rounding.

dentist Faculty there were twice as many dentists who had received their education in the state in which they were teaching as compared to those who received it elsewhere. If all Faculty and Preceptor responsents are considered in answering the above question, 64 percent of 197 respondents answering the question had received their primary dental occupational education in the state in which they were teaching. Seventy-four percent of the Faculty received their primary dental occupational education either in the state in which they were teaching or in one of the states contiguous to it.

Dental Task Information

A confidential report of the dental task responsibility responses for both the Faculty and the Preceptors of the dental auxiliary education program was prepared for each of the nineteen programs participating in the study. The report presented, by individual task statement, the frequency of response to each of the responsibility levels used in the responsibility scale. To present such an analysis of each program here, however, is both beyond the scope of this discussion and outside the objectives of the study. What is germane was the extent to which the Dental Task Inventory questionnaire was (a) effective in identifying any differences between the Faculty and the Preceptors in their perceptions of the task content of the curriculum, (b) effective in identifying any differences among various educational programs preparing individuals for the same dental auxiliary, and (c) effective in identifying any differences, or similarities, among any of the nineteen dental auxiliary education programs studied. A discussion of each of these and related questions will be presented in the following section.

Faculty And Preceptor Perceptions Of Task Content

Appendix H presents in a fourteen part table (H-1), a "profile" (see Methods

and Data Analysis section of Chapter III) presentation of both the Faculty's and the Preceptor's responsibility responses to the dental task statements. The table, by part, identifies each of the fourteen categories used for classifying the 563 dental task statements and, in addition, notes the number of task statements in the category. Under the "Level of Responsibility" headings in the table, the cumulative profile response for each auxiliary education program is noted by the percentage of the total responses falling within one of the three levels of responsibility. A composite profile of Faculty and of Preceptor responsibility responses was also prepared for both the community college and dental school based dental assisting education programs (Table H-1). In each of these profiles is reflected the highest responsibility response to the dental tasks, by category, as reported by any one of the respective individual education programs. An example of how the table is read is presented in a footnote at the bottom of each part of the table. The reader is encouraged to become familiar with the presentation of the data in the table before continuing with the following discussion.

It should be brought to the reader's attention that only in those cases where there was a 100 percent agreement to a specific level of responsibility by both the Faculty and the Preceptors, can there be an assurance that there was complete Faculty and Preceptor agreement to all tasks within the category. It should be recalled that Preceptor responses were received from only one of two dental hygiene programs using Preceptors and those Preceptors were not included in the table because to list them would violate the guarantee that individual programs would not be identified.

Comparing the percent response differences between the Faculty and the Preceptors in each of the nine dental assisting programs where Preceptors were utilized, it was noted that the Preceptor profile of the category was equal to

or greater than the Faculty profile of the category by an average of eighty percent; i.e., by category the Preceptors gave a response at least as high as the Faculty in seven of nine (on the average) dental assisting programs. In only one category (Patient Care: Impressions) (Table H-1, Part 10) did the Faculty profile exceed the Preceptor profile in more than fifty percent of the programs. These figures would indicate that, on the average, the Preceptor profile shows a higher level of performance for the dental assisting student, notwithstanding the fact that the student is in any one Preceptor's clinic an average of about four weeks. On the other hand, it must be realized that in each case, Faculty and Preceptor, the highest response from any one or more respondent was used as the base for comparison.

Another type of review of the individual dental assisting programs in Table H-1 indicates that there is usually agreement between the Faculty and Preceptor profiles in the "shift" of responsibility level by category; i.e., when the Faculty profiles show a tendency to move either to higher or to lower responsibility levels for a category, the Preceptor profiles also tend to shift in the same direction. This fact would indicate, by at least category title, that there is a degree of agreement between the Faculty and the Preceptors regarding the curriculum content at the category level, although differential amounts of agreement for the specific tasks within the category.

In categories, or Parts, 1, 2, 3, 6 and 14 of Table H-1 there is little or no indication from either the Faculty or the Preceptors that many of the dental tasks within the categories are to be performed "only under direct supervision." These findings would indicate that the Faculty and Preceptors were able not only to identify with these dental statements but also to consistently recognize them as dental tasks which they apparently taught to a "3-4" level of responsibility. Such findings again add to the validity of the responses and indicate

that the instrument can detect similarities and differences between the Faculty's and Preceptor's perceptions of the task content of the curriculum.

In reviewing the response differences between the community college Faculty and Preceptors it is evident that the Preceptors still tend to expect more tasks, within each category, to be taught and taught to a greater responsibility level than do the Faculty. In all fourteen categories the Preceptor percent response in the "3-4" responsibility level was equal to or greater than the Faculty response at the same level. Among the community college programs there were only nineteen dental tasks in the Dental Task Inventory that were not taught by the Faculty and there were only eight dental tasks which were similarly not taught by the Preceptors.

In a similar set of comparisons between the composite profiles for the Faculty and Preceptors of the dental school based dental assisting programs, there were only seven categories in which the Preceptors percent response to the "3-4" responsibility level was equal to or greater than the Faculty response to the same level. It should be noted, however, that the proportion of Preceptors to Faculty reporting from in the dental school based programs was about one to one whereas in the community college based programs the same ratio was approaching three to one.

Except for two categories (Part 7 (Patient Care: Preparations) and Part 9 (PC: Surgery and Surgically-Related) of Table H-1), the Faculty in the dental school based dental assisting programs reported no more total tasks taught in their reporting than did the Faculty in the community college programs: total tasks reported taught were 471 in each program. The dental school Faculty and Preceptors were much more conservative in their reporting of the number of tasks taught in the two referenced categories. Considering the Faculty responses, the dental school Faculty indicated they taught only 27 tasks between these two categories while the community college Faculty indicated they taught 75 tasks between the categories.

Program Comparisons Within An Auxiliary

The DTI questionnaire was designed not only to identify differences, or similarities, between Faculty and Preceptor perceptions of a curriculum's task content, whether by individual program or across programs by institutional settings, but it was also designed to identify similarities, or differences, among the individual education programs of a given auxiliary or between the individual programs of an auxiliary by educational level of completion. The data presented in Table H-1, and others, provides the opportunity to make such studies, within, of course, the limits of the kinds of program groupings identified in the study.

Dental Assisting Programs - A review of the range of percent responses at the "3-4" responsibility level in each Part (category) of Table H-1 reveals that the task content of the curricula among the dental assisting programs varies to a considerable extent. Only in Parts 2 and 3 (Housekeeping and Patient Care (PC): Records) was there rather uniform agreement that almost all tasks were taught and taught to the "shared or independent responsibility" levels. In Part 7 (PC: Preparation) there was fairly uniform agreement that few, if any, of the tasks were taught to the "3-4" responsibility levels. These findings may give additional validity to the study since most all of the tasks in this category would not be expected in other than a curriculum for preparing dentists.

Part 1 of Table H-1 does show a generally high response rate at the "3-4" level except for two dental assisting programs. These were the two programs where special sections of the business and accounting courses were taught just for dental assistants. Again, these findings add validity to the responses. In Parts 5 and 8 of the table there was a general indication that fewer tasks from these content areas were in the curricula.

Because of the small number of dental assisting programs in the study and because of the skewness of most of the "3-4" responsibility distributions in the other Parts of Table H-1, there is little value in reporting means, medians, or other types of descriptive statistical measures as indices of the differences and similarities among the dental assisting schools. As noted above, however, it is quite obvious that the task content of the curricula do differ among the programs except in three categories (content areas) noted. It should also be noted that if a student were to enroll in each dental assisting program, he or she would be taught to perform to the "3-4" responsibility level no less than 87 percent of the tasks in eleven of the categories (see "all programs" profiles).

Dental Hygiene Programs - The task content of the dental hygiene education programs is presented in Table H-1 in the same manner as were the data for the dental assisting programs described above. As was noted in an earlier section of this chapter, data were gathered from Preceptors in only one of the two dental hygiene programs where Preceptors were utilized. Because of such limited Preceptor data, the decision was made to not present that Preceptor data in this report. The data were retained, however, and will be used in future studies.

Comparisons of the percent response to the "3-4" responsibility level among the dental hygiene programs were made to identify any differences, or similarities among them. Parts (categories) 2 (Housekeeping), 3 (PC: Records), and 6 (PC: Preventive and Patient Education) of Table H-1 indicate there was fairly uniform agreement among the dental hygiene programs that essentially all the dental tasks in these categories may be performed with "shared or independent responsibility" by the graduate. Part 7 (PC: Preparation) reveals agreement

among programs that tasks in this category may not be performed at the "3-4" responsibility level by the graduate.

Responsibility level "2" ("graduate will be able to perform, but only under direct supervision") was not, as a rule, used among the dental hygiene Faculty. Evidently the dental tasks taught in the dental hygiene curricula were taught to be performed with "shared or independent" responsibility or they were not taught.

The task content and responsibility profile for the two-year Associate Degree dental hygiene programs offered in community colleges and technical institutes (profile indicates the highest reported responsibility response to each task taught by one or more Faculty members in the respective program) discloses that if a student were to enroll in each of the seven programs, he or she would be taught to perform to the "3-4" responsibility level at least 85 percent of the tasks in eight of the categories (see Table H-1, Parts 1, 2, 3, 4, 5, 6, 10, and 14). In three categories (7, 9, 11) the graduate would be able to perform no more than about one-third of the tasks to the same level.

In a profile of the two-year certificate dental hygiene program offered in the dental school setting, Table H-1 manifests that in only four categories (2, 3, 4, and 6) would the student be taught to perform to the "3-4" responsibility 85 percent or more of the tasks within each of the categories. In a similar type profile of the four-year Baccalaureate Degree dental hygiene program offered in the dental school setting, Table H-1 indicates that in eleven of the categories the student would be taught to perform to the "3-4" responsibility level 85 percent or more of the tasks in each of the categories.

These various comparisons among the dental hygiene programs indicate that the Dental Task Inventory instrument has detected at least major similarities, and differences, among the programs, and the instrument may be identifying to

some extent the more subtle differences, and similarities among the program.

Dental Laboratory Technician Programs - Only two dental laboratory technician education programs were included in this study, but they were the total population of accredited programs from the state in which the auxiliary programs were selected. Table H-1 suggests, as was noted in an earlier section of this chapter, that the dental laboratory technician Faculty were apparently able to discriminate quite well among the 563 dental task statements utilized in the Dental Task Inventory instrument. In ten categories the "combined" profile of the programs indicated that not more than about one-third of the tasks were taught to the "3-4" responsibility level. Only in category 11 (PC: Dental Laboratory) does the combined profile indicate that the students were prepared to practice 85 percent or more of the tasks in the category. The Faculty of the dental laboratory technician programs made very little use of the "2" responsibility level; in fact, their combined profile identified only two tasks in the Dental Task Inventory that were taught to be performed "only under direct supervision" ("Fit preformed orthodontic band, indirect"; and "Make periodontal appliance").

The individual profiles of the two dental laboratory technician programs were in very close agreement at the "3-4" responsibility level across all categories of dental task statements. There was not more than a fourteen percent (12 tasks) difference of tasks taught among all categories and in nine categories there was no more than an eight percent difference between their responses at the "3-4" responsibility level.

Program Comparisons Between Auxiliaries

A question had often been raised regarding the extent of the differences

in dental tasks performed, both in kind and by level of responsibility, between the dental assistants and dental hygienists, and among all three dental auxiliaries. The question has been asked most recently in light of recent "extended function" curriculum developments in the dental auxiliaries. It was anticipated that the Dental Task Inventory instrument would provide the data base for making the comparisons needed to provide some answers to these and related questions. In the following discussion the findings will be primarily couched in the context of which dental tasks were the auxiliary graduates being prepared to perform to a level of shared or independent responsibility such that the dentist may pursue other functions or procedures and, therefore, increase the flow of dental care services.

Before turning to the primary discussion, however, there were some more general findings regarding differences, and agreements, among the three auxiliaries that are worth noting. If comparisons are made among the auxiliaries of the extent to which dental tasks were taught to the "2" responsibility level (see Table H-1), it will immediately be seen that neither the dental hygiene nor the dental laboratory technician education programs make as much use of this level of responsibility as do the dental assisting programs. The dental hygiene and the dental assisting programs showed a tendency to make more use of the "2" level in categories 5 (Patient Care (PC): Analysis, Treatment Planning, and Consultation), 8 (PC: Anesthesia and Medications), 9 (PC: Surgery and Surgically Related), 11 (PC: Dental Laboratory), 12 (PC: Insertions and Restoration), and 13 (PC: Adjustments and Repairs). In light of the traditional view that the dental assistant was the dentist's "helper," the percent of response to the "2" level is not unexpected, but for the dental hygienist, who has been somewhat identified as a more independent auxiliary

than the dental assistant, it is interesting to note the percent of "2" level responses.

In an attempt to identify the highest levels from each of the individual programs in each auxiliary, a Faculty response "all programs" profile was constructed for each of the three auxiliaries. This was accomplished by first constructing the Faculty response profile for each individual auxiliary program, and then by taking the highest response to any given task by any one or more of the individual Faculty profiles, an "all programs" Faculty profile was constructed. The individual program profiles are reported in Table H-1 and summarized in Table 12.

Table 12 reveals an exceptionally high correspondence between the dental assisting and dental hygiene curricula. A return to Table H-1 for a review of the correspondence between the same auxiliaries but based in community colleges and technical institutes will reveal as high a correspondence between these programs. There was a greater tendency toward a higher percent response at the "3-4" responsibility level for each of the auxiliaries in the "all programs" profiles of Table 12 than there was for the "community college and technical institute" profiles of the same auxiliaries in Table H-1. In only three categories: 7 (PC: Preparations), 8 (PC: Anesthesia and Medications), and 9 (PC: Surgery and Surgically Related) were there <u>less</u> than 85 percent of the category's tasks taught to the "3-4" responsibility level in both dental assisting and dental hygiene at the "all program" profile level. In only six categories was there an 85 percent or greater "3-4" response rate for each of the dental assisting and dental hygiene "community college and technical institute" profiles (Table H-1). The two dental assisting and the two dental hygiene dental school based program's profiles did, therefore, make a marked contribution to the "all programs" profiles of both auxiliaries.

TABLE 12

"ALL PROGRAMS" FACULTY PROFILES*, BY CATEGORY,
FOR THREE DENTAL AUXILIARY EDUCATION PROGRAMS

CATEGORY	DENTAL AUXILIARY								
	Dental Assisting			Dental Hygiene			Dental Laboratory Technician		
	NR-1** %	2 %	3-4 %	NR-1 %	2 %	3-4 %	NR-1 %	2 %	3-4 %
1. Business and office management	0	0	100	1	0	99	62	5	33
2. Housekeeping--clinical and general patient care	0	0	100	0	0	100	44	0	56
3. Records--dental, medical	0	0	100	0	0	100	83	8	8
4. Examinations--including diagnostic tests and x-ray	0	10	90	0	0	100	92	0	8
5. Analysis, treatment planning, and consultation	0	7	93	0	4	96	67	0	33
6. Preventive and patient education	0	0	100	0	0	100	84	4	12
7. Preparations	0	69	31	38	31	31	92	0	8
8. Anesthesia and medications	13	9	78	16	6	78	81	0	19
9. Surgery and surgically related	0	67	33	48	16	37	100	0	0
10. Impressions	0	0	100	0	0	100	41	0	59
11. Dental Laboratory	0	1	99	2	2	95	0	2	98
12. Insertions and Restorations	0	13	87	2	6	92	79	2	19
13. Adjustments and repairs	0	12	88	0	12	88	48	0	52
14. Chairside assisting and clinical rapport	0	0	100	0	0	100	75	2	24

*Each auxiliary's profile represents the percent of tasks taught to indicated level of responsibility within respective category as reported by the highest responsibility response of any one or more of the individual education programs in the indicated auxiliary.

**Responsibility response levels: (NR-1) no response or not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform to shared or independent level of responsibility.

The dental laboratory technician "all programs" profile had little correspondence with either the dental assisting or dental hygiene programs except in category 11 (PC: Dental Laboratory). In category 11 the correspondences were not only high but so were the percent of tasks taught to the "3-4" responsibility level. In fact, the agreements at this level may suggest some question as to the validity of the dental assisting and of the dental hygiene "profile" responses in this category.

Since the profiles constructed for the various groupings of the three auxiliaries do not reflect the extent to which each of the individual program profiles contributed to the group profiles (for example, "all programs" group profile), Table 13 was prepared to present a review of the manner in which the respective individual program profiles contributed to each group profile. The frequency of response to each responsibility level, by category, was recorded for each program in the group. The total frequency for each responsibility level was then computed and reported as a percent of all responses in the respective category. This produced a picture of how the individual program profiles worked together to create the group profile, or to put it another way, Table 13 presents the "average" response of the individual programs' profiles. For example, in category 1, 66 percent of all the individual program profile responses, as reported by the Faculty, were "3-4" responses among the eight community college based, certificate level dental assisting programs. The table does not say, however, that there was agreement, by task, to the responsibility level among the eight programs. In fact, by noting the "community college based, certificate level dental assisting" group profile for category 1, it will be seen that among the 66 percent "3-4" response rate (Table 13), 95 percent of the tasks in category 1 received a "3-4" response (Table H-1).

TABLE 13

AVERAGE* FACULTY RESPONSE, FROM INDIVIDUAL PROGRAM PROFILES,

BY CATEGORY AND BY AUXILIARY PROGRAM, TO DENTAL TASK STATEMENTS

AUXILIARY PROGRAM BY TYPE, BY LEVEL & INSTITUTIONAL SETTING	PROGRAMS N	CATEGORY 1** NR-1 %	2 %	3-4 %	CATEGORY 2 NR-1 %	2 %	3-4 %	CATEGORY 3 NR-1 %	2 %	3-4 %	CATEGORY 4 NR-1 %	2 %	3-4 %	CATEGORY 5 NR-1 %	2 %	3-4 %
Dental Assisting																
Certificate Programs in Community College	8	32	3	66	5	0	95	1	2	97	46	17	37	48	14	38
Certificate Programs in Dental Schools	2	7	2	91	0	0	100	0	0	100	10	12	78	24	9	67
All Programs	10	27	2	71	4	0	96	1	2	97	34	16	45	43	13	44
Dental Hygiene																
Associate Degree Programs in C. C. & Technical Institutes	5	43	2	56	0	0	100	0	0	100	29	5	67	37	4	59
Certificate Programs in Dental Schools	1	28	15	58	0	0	100	0	0	100	10	3	87	22	4	74
Baccalaureate Degree Programs in Dental Schools	1	7	1	92	0	0	100	0	0	100	0	3	97	0	11	89
All Programs	7	35	3	61	0	0	100	0	0	100	22	4	74	30	5	66
Dental Laboratory Technician																
Associate Degree Programs in C. C. & Technical Institutes	2	74	3	23	53	0	47	92	4	4	96	0	4	74	2	24

* Percent of all responses, from all identified programs, which were at the indicated responsibility level for a given category of dental task statements; e.g., in reviewing all responses to those dental task statements in Category 1 as reported by eight community college based, certificate level dental assisting programs, 66 percent of the responses (57 Tasks) were at the "3-4" responsibility level (student has been taught to perform dental task to the shared or independent responsibility level); among the five community college based, Associate degree level dental hygiene programs, 43 percent of the schools' responses indicated that the dental tasks in Category 1 were "not responded to or not taught" (NR-1); two percent of the responses (representing two tasks) from the same dental hygiene programs and in the same category were at the "2" responsibility level (student will be able to perform task, but only under direct supervision). This table, then, provides a look at the "average" way in which the faculty of the indicated programs tended to respond to a given category of dental task statements.

** Categories: (1) Business and Office Management (87 tasks); (2) Housekeeping -- Clinical and General (16 tasks); (3) Patient Care: Records -- Dental, Medical (12 tasks); (4) Patient Care: Examinations -- Including Diagnostic Tests and X-ray (39 tasks); (5) Patient Care: Analysis, Treatment Planning, and Consultation (27 tasks).

TABLE 13 - Continued

AVERAGE* FACULTY RESPONSE, FROM INDIVIDUAL PROGRAM PROFILES,

BY CATEGORY AND BY AUXILIARY PROGRAM, TO DENTAL TASK STATEMENTS

AUXILIARY PROGRAM BY TYPE, BY LEVEL & INSTITUTIONAL SETTING	PROGRAMS N	CATEGORY 6** NR-1 %	2 %	3-4 %	CATEGORY 7 NR-1 %	2 %	3-4 %	CATEGORY 8 NR-1 %	2 %	3-4 %	CATEGORY 9 NR-1 %	2 %	3-4 %	CATEGORY 10 NR-1 %	2 %	3- %
Dental Assisting																
Certificate Programs in Community College	8	22	16	63	51	46	3	60	13	27	58	34	9	21	18	6
Certificate Programs in Dental Schools	2	8	4	88	85	12	4	41	9	50	77	5	18	6	0	94
All Programs	10	19	13	68	58	39	3	56	12	32	61	28	11	18	14	68
Dental Hygiene																
Associate Degree Programs in C. C. & Technical Institutes	5	2	1	98	94	5	2	55	4	41	79	4	17	56	2	41
Certificate Programs in Dental Schools	1	4	0	96	85	8	8	50	13	38	65	11	24	47	12	41
Baccalaureate Degree Programs in Dental Schools	1	0	0	100	46	31	23	19	16	66	59	19	22	0	0	100
All Programs	7	2	1	98	86	9	5	49	7	44	74	7	19	47	3	50
Dental Laboratory Technician																
Associate Degree Programs in C. C. & Technical Institutes	2	92	2	6	92	0	8	89	0	11	100	0	0	44	6	50

* Percent of all responses, from all identified programs, which were at the indicated responsibility level for a given category of dental task statements; e.g., in reviewing all responses to those dental task statements in Category 6 as reported by eight community college based, certificate level dental assisting programs, 63 percent of the responses (sixteen tasks) were at the "3-4" responsibility level (student has been taught to perform dental task to the shared or independent responsibility level); among the five community college based, Associate degree level dental hygiene programs, 2 percent of the schools' responses indicated that the dental tasks in Category 6 were "not responded to or not taught" (NR-1); one percent of the responses from the same dental hygiene programs and in the same category were at the "2" responsibility level (student will be able to perform task, but only under direct supervision). This table, then, provides a look at the "average" way in which the faculty of the indicated programs tended to respond to a given category of dental task statements.

** Categories: (6) Patient Care: Preventive and Patient Education (25 tasks); (7) Patient Care: Preparations (13 tasks); (8) Patient Care: Anesthesia and Medications (32 tasks); (9) Patient Care: Surgery and Surgically Related (63 tasks); (10) Patient Care: Impressions (17 tasks).

TABLE 13 - Continued

AVERAGE* FACULTY RESPONSE, FROM INDIVIDUAL PROGRAM PROFILES,

BY CATEGORY AND BY AUXILIARY PROGRAM, TO DENTAL TASK STATEMENTS

AUXILIARY PROGRAM BY TYPE, BY LEVEL & INSTITUTIONAL SETTING	PROGRAMS	CATEGORY 11**			CATEGORY 12			CATEGORY 13			CATEGORY 14		
		NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
	N	%	%	%	%	%	%	%	%	%	%	%	%
Dental Assisting													
Certificate Programs in Community College	8	56	11	32	48	38	13	61	25	14	13	8	79
Certificate Programs in Dental Schools	2	33	1	66	37	3	60	35	8	58	4	1	95
All Programs	10	52	9	39	46	31	23	55	22	23	11	6	82
Dental Hygiene													
Associate Degree Programs in C. C. & Technical Institutes	5	80	6	14	69	9	21	80	5	15	31	4	65
Certificate Programs in Dental Schools	1	82	5	13	60	26	15	82	6	12	10	15	75
Baccalaureate Degree Programs in Dental Schools	1	6	1	93	6	6	87	0	12	88	0	0	100
All Programs	7	70	5	25	59	11	30	69	6	25	23	5	71
Dental Laboratory Technician													
Associate Degree Programs in C. C. & Technical Institutes	2	5	2	93	85	1	14	56	0	44	79	2	19

* Percent of all responses, from all identified programs, which were at the indicated responsibility level for a given category of dental task statements; e.g., in reviewing all responses to those dental task statements in Category 11 as reported by eight community college based, certificate level dental assisting programs, 32 percent of the responses (27 tasks) were at the "3-4" responsibility level (student has been taught to perform dental task to the shared or independent responsibility level); among the five community college based, Associate degree level dental hygiene programs, 80 percent of the schools' responses indicated that the dental tasks in Category 11 were "not responded to or not taught" (NR-1); six percent of the responses from the same dental hygiene programs and in the same category were at the "2" responsibility level (student will be able to perform task, but only under direct supervision). This table, then, provides a look at the "average" way in which the faculty of the indicated programs tended to respond to a given category of dental task statements.

** Categories: (11) Patient Care: Dental Laboratory (85 tasks); (12) Patient Care: Insertions and Restorations (47 tasks); (13) Patient Care: Adjustments and Repairs (33 tasks); (14) Patient Care: Chairside Assisting and Clinical Support (67 tasks).

The above example indicates that there was not uniform agreement among the individual program profiles of the community colleges based dental assisting programs. In the same manner there was not uniform agreement among the various groupings of individual program profiles for any of the dental assisting or dental hygiene groupings. There was, however, a much stronger agreement among the two dental laboratory technician programs -- compare "average" response for these programs (Table 13) with the group profile response in Table H-1.

Table F-1, presented in the Appendix F, presents an examination of the individual Faculty responses, by dental auxiliary, to each task within each category, and thus the opportunity to refine the analysis presented above by category only. Such analyses, however, are beyond the scope of the present study and, therefore, will not be dealt with at this time. The following discussion will, however, make use of the data presented in Appendix F, and the reader is encouraged to become familiar with it.

The "all program" profiles of the dental assisting and of the dental hygiene programs had such a close correspondence across the level of responsibility, not only by category but across all categories (Table H-1) that it was decided to examine the number of exact responsibility agreements by task statement. In an extension of this type of analysis, each auxiliary's "all program" profile was checked against the "all program" profile of each of the other two auxiliaries. The complete results of these analyses are found in Table G-1 (Appendix G). In addition, Table G-2 presents the findings of a similar study among the "community college and technical institute" profiles of the three auxiliaries.

The following table (Table 14) provides a summary of the complete analyses found in Appendix G. The "all program" profiles of the dental assisting and dental hygiene education programs have between them 498 task statement items

TABLE 14

RESPONSIBILITY RESPONSE AGREEMENTS OF DENTAL AUXILIARY FACULTY TO 563 DENTAL TASKS BY COMBINED HIGHEST RESPONSE FROM EACH AUXILIARY

AUXILIARY EDUCATION PROGRAMS	RESPONSIBILITY LEVELS* NR-1 N	NR-1 %	2 N	2 %	3-4 N	3-4 %	ROW TOTALS N	ROW TOTALS %
From 19 Auxiliary Programs								
Dental Assisting and Dental Hygiene	3	0.5	18	3.2	477	84.7	498	88.5
Dental Assisting and Dental Laboratory Technician	2	0.4	0	0.0	185	32.9	187	33.2
Dental Hygiene and Dental Laboratory Technician	40	7.1	0	0.0	184	32.7	224	39.8
From 15 Community College and Technical Institute Programs								
Dental Assisting and Dental Hygiene	13	2.3	12	2.1	353	62.7	378	67.1
Dental Assisting and Dental Laboratory Technician	12	2.1	0	0.0	168	29.8	180	32.0
Dental Hygiene and Dental Laboratory Technician	86	15.3	1	0.2	123	21.8	210	37.3

*Responsibility Levels: (NR-1) No response and not taught; (2) graduate will be able to perform but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. This table may be read as follows: 563 dental tasks were evaluated. Of these, 477, or 84.7%, were taught to the 3-4 level in one or more dental assisting programs and the same 477 tasks were taught to the same level in one or more dental hygiene programs. Forty tasks were not taught in either dental hygiene or dental laboratory technician programs. There was exact agreement to 378 tasks between both dental assisting and dental hygiene programs offered in community colleges and technical institutes.

(88.5 percent of 563 total tasks) in which there was exact agreement regarding whether or not the tasks were taught and the responsibility level to which they were taught, if they were taught. Of the 498 items, 96 percent (477 task statements) of them were agreements at the "3-4" responsibility level. Only eighteen of the task statements had agreement at the "2" responsibility level, and three tasks were not taught by either auxiliary. These data would suggest that the over-all differences between these two programs, over all individual programs in each auxiliary, lie in the 65 tasks in which there is not exact agreement. Those 65 tasks are marked by an asterisk (*) in Table F-1 (Appendix F).

In recalling the tendency on the part of both the dental hygiene and the dental laboratory technician programs either not to teach or to teach to the "3-4" responsibility level, it was not too surprising to see somewhat more agreement between these two programs than between the dental assisting and dental laboratory technician programs. It is noted, however, that both the dental assisting and dental hygiene profiles share exact agreement at the "3-4" responsibility level with the dental laboratory technician profile in 184 and 185 task statements, respectively.

Among the "community college and technical institute" profiles for the three auxiliaries, there is noted a decrease in exact agreements by all comparisons (Table 14). In only 67 percent of the 563 task statements was there exact agreement between the dental assisting and dental hygiene program profiles. This represents a 24 percent decrease from the same program comparisons made using the "all programs" profiles. In other words, between the four dental school based dental assisting and dental hygiene programs, there were an additional 120 exact agreement responses.

There was little change in the over-all number of exact agreements betweeen either the dental assisting or the dental hygiene program profiles and the dental

laboratory technician program profile in the "community college and technical institute" profiles as compared to the "all program" profiles, but there was some difference in the distribution of the agreements. This was particularly true between the dental assisting and dental laboratory technician program profiles where there was a 500 percent difference at the "NR-1" response level.

Hierarchical Clustering of Auxiliary Programs

Although the foregoing findings are generally indicative of the ability of the Dental Task Inventory instrument to identify differences, and agreements, both within an auxiliary's educational programs and among the three auxiliary's educational programs, precision in identifying the reasons for those agreements, and differences, would require development of a more extensive method for analyzing their responses to the 563 dental task statements. However, as was noted in the previous chapter, a method was found in the literature which was used effectively to cluster those individual educational programs with greatest similarities in the task content of their curricula. Johnson (1967) referred to the method as a Hierarchical Clustering Scheme, and as titled, the method utilized an algorithm which generated a clear, explicit, and intuitively rational pictorial presentation (clustering) of those auxiliary programs with empirical measures of similarity.

Clusterings Across All Auxiliary Programs

Table 15 presents the results of the clustering schema for the nineteen dental auxiliary education programs used in this study. An empirical measure of the similarity of response to all 563 dental task statements was computed between every combination of program pairings using the sum of the squared

differences between the corresponding components of the individual program profiles (see Methods and Procedures section of previous chapter). Each of the 171 similarity measures was then compared to identify that pair of auxiliary programs with the smallest discrepancy between similarity measures; i.e., those programs most similar in their identified task content. After the first pair was identified and clustered, the remaining similarity measures, together with a new similarity measure for the first cluster with respect to the remaining similarity measures, were again compared to find the next program or pair of programs most similar in task content, whereupon another cluster was added to the hierarchy. The process continued until the hierarchy (schema) was completed. It should be noted there is an inverse relationship between the magnitude of the similarity value and the strength of the cluster; i.e., as the similarity values increased, there was less and less similarity among the, as yet, unclustered programs.

Before reviewing the clustering within Table 15, it is suggested that the reader note the ordering of the dental auxiliary programs across the top of the table. First, there is a dental hygiene program, this is followed by six of the dental assisting programs, after which appear the remaining six dental hygiene programs, which in turn are followed by the remaining four dental assisting programs. Finally, the two dental laboratory technician programs complete the order. The ordering of the programs is determined by the manner in which the clusterings took place and, therefore, there is an intuitive feeling from the beginning that there are perhaps two types of dental assisting programs in the population. In addition there appears to be one dental hygiene program which is more like a dental assisting program than like the other dental hygiene programs. And, of course, it appears that the two dental laboratory programs have fairly close similarity.

The first cluster identified in Table 15 is noted to be between a dental hygiene program and a dental assisting program. Further identification of these two programs indicates that they are both located in the same institutional setting, and that several members of each program's Faculty teach in both auxiliary programs. It is further noted from the table that the proportionate increase between the similarity values 504 and 2035 is greater than between all other similarity values. This fact would further indicate that these two programs are distinctly different from all other programs. The question arises as to whether these programs are really as similar as they appear to be or whether the shared Faculty in the programs had some difficulty in separating the responsibility levels to which they prepared the students in each of the two programs. (It should be recalled that most shared Faculty completed a DTI questionnaire for each program in which they taught).

The next cluster to appear in the hierarchy is that of the dental laboratory technician programs. It might have been suspected from a review of Tables H-1 and 13 that these two programs would have formed the first cluster, but the Hierarchical Clustering Scheme (HCS) method of analysis identified a first relationship which would have been difficult to identify from scanning the tables of data presented thus far.

The third cluster identified in the HCS of Table 15 is formed by the first cluster and another dental assisting program. The unique feature of this cluster is that it remains as an identity until a point is reached in the clustering beyond which there is most likely little or no meaningful relationship among further clusters.

Finally, the two groups of dental assisting programs and the dental hygiene programs begin to cluster among themselves. Once again, however, there is a cluster formed between four dental assisting programs and a dental hygiene

TABLE 15

HIERARCHICAL CLUSTERING SCHEME FOR NINETEEN

DENTAL AUXILIARY EDUCATION PROGRAMS

SIMILARITY VALUE*	DENTAL AUXILIARY PROGRAMS**																		
	DH14	DA14	DA09	DA10	DA12	DA01	DA13	DH08	DH07	DH05	DH06	DH02	DH05	DA11	DA03	DA06	DA02	DL05	DL01
0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
504	XXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2035	XXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	XXXX	
2591	XXXXXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	XXXX	
2729	XXXXXXX	.	.	.	.	.	XXXX	.	.	.	.	.	.	.	.	.	.	XXXX	
2891	XXXXXXX	.	XXXX	.	.	XXXX	.	.	.	.	.	.	.	.	.	.	.	XXXX	
3026	XXXXXXX	.	XXXX	.	.	XXXX	.	XXXX	.	.	.	.	.	.	.	.	.	XXXX	
3228	XXXXXXX	.	XXXX	.	.	XXXX	.	XXXX	.	.	.	.	.	XXXX	XXXX	XXXX	XXXX	XXXX	
3315	XXXXXXX	.	XXXXXXX	.	XXXX	.	XXXX	.	XXXX	XXXX	XXXX	XXXX	XXXX						
3499	XXXXXXX	.	XXXXXXX	.	XXXX	.	XXXX	.	XXXX	XXXX	XXXX	XXXX	XXXX						
3715	XXXXXXX	XXXXXXXXXX	.	XXXX	.	XXXX	XXXX	XXXX	XXXX	XXXX	XXXX								
3865	XXXXXXX	XXXXXXXXXX	.	XXXXXXX	XXXX	XXXX	XXXX	XXXX	XXXX										
4029	XXXXXXX	XXXXXXXXXXXXX	XXXXXXX	XXXX	XXXX	XXXX	XXXX												
4263	XXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXX	XXXX	XXXX													
4957	XXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXX	XXXX														
5718	XXXXXXXXX	XXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXX	XXXX														
5856	XXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXXXXXXXXX	XXXX																
10009	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXX																
11590	XXXXXXXXXXXXXXXXXXXX

hygiene program is more similar to the dental assisting programs it is clustered with than to the other dental hygiene programs in the study.

Because of the unique clustering between programs DH14 and DA14 in Table 15, these two programs were removed from the HCS to see what new relationships would develop. It will also be recalled that DA09 and DH08 each formed in clusters which did not further cluster until very late, and it was questioned how they would cluster in a new schema. Table 16 presents the new schema using just seventeen of the original programs. (Note that a new pattern of program arrangement has resulted.)

DA09, which had clustered early in Table 15 with the two eliminated programs, clustered much later in Table 16. In Table 15, DA10 had clustered late so it was not too surprising to see DA09 and DA10 form a late cluster in Table 16. Evidently these two dental assisting programs were different from other dental assisting programs and were not too alike themselves. DH08 again clustered late and with the dental assisting programs rather than with the dental hygiene programs. In a future analysis DH08 will be studied to identify the reasons for its singular identity among the dental hygiene programs. No other differences were noted between the two tables.

Clusterings Across Community College Auxiliary Programs

Since the community college and technical institute based program profiles had shown some marked differences from the "all programs" profiles presented in previous tables, it was decided to examine the clusterings among the fifteen community college and technical institute programs. Table 17 presents the results of the analysis. As in Table 15, the HCS in Table 17 presents a picture of two groups of dental assisting programs. DH08 continues to cluster with one of the dental assisting groups. Within each of the two dental assisting groups

TABLE 16

HIERARCHICAL CLUSTERING SCHEME FOR SEVENTEEN

DENTAL AUXILIARY EDUCATION PROGRAMS

SIMILARITY VALUE*	DENTAL AUXILIARY PROGRAMS**																
	DL01	DL05	DA02	DA06	DA03	DA11	DH05	DH02	DH06	DH15	DH07	DH08	DA12	DA01	DA13	DA10	DA09
0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2035	XXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2729	XXXX	.	.	.	.	.	.	.	.	XXXX	.	.	.	.	.	.	.
2891	XXXX	.	.	.	.	.	.	.	.	XXXX	.	XXXX	.	.	.		
3026	XXXX	.	.	.	.	XXXX	.	XXXX	.	XXXX	.	.	.	.			
3228	XXXX	XXXX	.	.	XXXX	.	XXXX	.	XXXX	.	XXXX	.	.	.			
3315	XXXX	XXXX	.	.	XXXX	.	XXXX	.	XXXX	.	XXXXXXX	.	.				
3499	XXXX	XXXX	XXXX	XXXX	.	XXXX	.	XXXX	.	XXXXXXX	.	.					
3695	XXXX	XXXX	XXXX	XXXX	.	XXXX	.	XXXX	.	XXXXXXX	XXXX						
3865	XXXX	XXXX	XXXX	XXXX	XXXXXXX	.	XXXXXXX	XXXX									
3994	XXXX	XXXX	XXXX	XXXX	XXXXXXX	XXXXXXXXXX	XXXX										
4263	XXXX	XXXX	XXXX	XXXXXXXXXXXXX	XXXXXXXXXX	XXXX											
4312	XXXX	XXXX	XXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXXXXX												
4957	XXXX	XXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXXXXX													
5856	XXXX	XXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXX														
8706	XXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX															
11590	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX																

*The "similarity value" is a "least distance" measure of the difference between two or more of the nineteen program's profiles. The first clustering (DH14 with DA14) was based on the sum of the squared differences between corresponding components of the profiles. As the similarity values increase, the relative distance increases between the as yet unclustered programs; hence, late clusterings indicate greater differences in program agreement.

**Dental auxiliary program codes: (DH) dental hygiene, (DA) dental assisting, (DL) dental laboratory technician, and DL01 is a dental laboratory technician program from site 01.

there appears to be two subgroups; e.g., DA02 and DA06 form an early cluster which continue as an identity until quite late when they finally cluster with DA03 and DA11. In the second major dental assisting group it will be seen that

TABLE 17

HIERARCHICAL CLUSTERING SCHEME FOR FIFTEEN

COMMUNITY COLLEGE DENTAL AUXILIARY EDUCATION PROGRAMS

SIMILARITY VALUE*	DENTAL AUXILIARY PROGRAMS**														
	DL01	DL05	DA02	DA06	DA03	DA11	DH05	DH02	DH06	DH07	DH08	DA12	DA01	DA09	DA10
0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2035	XXXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2891	XXXXX	.	.	.	.	.	.	.	.	.	.	XXXXX	.	.	.
3026	XXXXX	.	.	.	.	XXXXX	.	.	.	.	.	XXXXX	.	.	.
3128	XXXXX	XXXXX	.	.	XXXXX	.	.	.	XXXXX	.	.	.			
3499	XXXXX	XXXXX	XXXXX	XXXXX	.	.	.	XXXXX	.	.					
3695	XXXXX	XXXXX	XXXXX	XXXXX	.	.	.	XXXXX	XXXXX						
3756	XXXXX	XXXXX	XXXXX	XXXXX	.	.	XXXXXXXXX	XXXXX							
3865	XXXXX	XXXXX	XXXXX	XXXXX	XXXXX	XXXXXXXXX	XXXXX								
4263	XXXXX	XXXXX	XXXXX	XXXXXXXXXXXXX	XXXXXXXXX	XXXXX									
4296	XXXXX	XXXXX	XXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX										
4957	XXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX											
7856	XXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXX	XXXXXXXXXXXXXXXXX												
8706	XXXXX	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX													
11590	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX														

*The "similarity value" is a "least distance" measure of the difference between two or more of the nineteen program's profiles. The first clustering (DH14 with DA14) was based on the sum of the squared differences between corresponding components of the profiles. As the similarity values increase, the relative distance increases between the as yet unclustered programs; hence, late clusterings indicate greater differences in program agreement.

**Dental auxiliary program codes: (DH) dental hygiene, (DA) dental assisting, (DL) dental laboratory technician, and DL01 is a dental laboratory technician program from site 01.

DA12 and DA01 form an early cluster which maintains its identity until quite late when it finally forms a cluster with DA09 and DA10. Also interesting is the fact that DH06 and DH07 are not too similar to DH05 and DH02. Further analyses to resolve the reasons for these differences are planned for the future.

Clusterings Across All Auxiliary Programs Using Faculty And Preceptor Profiles

The dental assisting education programs, as a whole, made considerable utilization of Preceptors, and this study collected data from 53 percent of all Preceptors identified among all dental assisting programs (Table E-1, Appendix E). However, as noted in an earlier section of this chapter, two Preceptor groups (from sites 001 and 011) had a response rate sufficiently low to reduce the 62 percent mean response rate for the other programs. These points are made to provide some perspective for the data to be discussed below and presented in Table 18.

Eight of the dental assisting programs utilized in this study were community college based. Each of the eight programs utilized Preceptors on their faculty, and earlier sections of this chapter have dealt with the differences, and agreements, between the Faculty and Preceptor profiles, both within an auxiliary program and among programs of the same auxiliary. As a further study of these two faculty groups, the HCS method of analysis was used to see if the Faculty and Preceptor profiles from the same programs would cluster. To add another dimension to the analysis, the Faculty profiles of both the dental hygiene and dental laboratory technician programs were added to see if the dental assisting Preceptor profiles matched these more closely than the Faculty dental assisting profiles. Table 18 presents the findings of the analysis.

Only one of the paired Faculty and Preceptor dental assisting profiles formed an immediate cluster: FDA11 and PDA11 (See Table 18 for footnote on coding). FDA01 formed in a cluster with FDA12 and PDA03 and this cluster eventually formed a new cluster with PDA01 which indicated some similarities between the two site 01 profiles. As for the other pairs of site profiles, there were apparently fewer similarities between them than among other combinations of profiles.

TABLE 18

HIERARCHICAL CLUSTERING SCHEME FOR FIFTEEN COMMUNITY COLLEGE DENTAL AUXILIARY EDUCATION PROGRAMS USING FACULTY AND PRECEPTOR PROFILES

SIMILARITY VALUE*	DENTAL AUXILIARY PROGRAMS**																							
	DL01	DL05	FDA02	FDA06	FDA03	PDA11	FDA11	DH05	DH02	DH06	DH07	FDA10	PDA01	FDA11	FDA12	PDA03	DH08	PDA02	PDA10	PDA09	PDA12	FDA09	PDA06
0	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2035	XXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.
2449	XXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	XXXX	.	.	.
2554	XXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	.	XXXX	XXXX	.	.
2770	XXXX	.	.	.	.	.	.	.	.	.	.	.	.	.	XXXX	.	.	.	.	XXXX	XXXX	.	.
2941	XXXX	.	.	.	.	.	.	.	.	.	.	.	.	XXXXXXX	.	.	.	.	.	XXXX	XXXX	.	.
2954	XXXX	.	.	.	XXXX	.	.	.	.	.	.	.	.	XXXXXXX	.	.	.	.	.	XXXX	XXXX	.	.
3026	XXXX	.	.	.	XXXX	XXXX	.	.	.	.	.	.	.	XXXXXXX	.	.	.	.	.	XXXX	XXXX	.	.
3189	XXXX	.	.	.	XXXX	XXXX	.	.	.	.	.	.	.	XXXXXXX	.	.	.	XXXXXXX	.	XXXX	XXXX	.	.
3228	XXXX	XXXX	.	.	XXXX	XXXX	.	.	.	.	.	.	.	XXXXXXX	.	.	.	XXXXXXX	.	XXXX	XXXX	.	.
3247	XXXX	XXXX	.	.	XXXX	XXXX	.	.	.	.	.	.	XXXXXXXXXX	.	.	.	.	XXXXXXX	.	XXXX	XXXX	.	.
3302	XXXX	XXXX	.	.	XXXX	XXXX	.	.	.	.	.	.	XXXXXXXXXX	.	.	XXXX	.	XXXXXXX	.	XXXX	XXXX	.	.
3468	XXXX	XXXX	.	.	XXXX	XXXX	.	.	.	.	.	.	XXXXXXXXXX	.	.	XXXX	.	XXXXXXX	.	XXXXXXXXXXXXXX			
3499	XXXX	XXXX	.	XXXXXX		XXXX	.	.	.	.	.	.	XXXXXXXXXX	.	.	XXXX	.	XXXXXXX	.	XXXXXXXXXXXXXX			
3715	XXXX	XXXX	.	XXXXXXX		XXXX	.	.	.	.	.	XXXXXXXXXXXXX		.	.	XXXX	.	XXXXXXX	.	XXXXXXXXXXXXXX			
3865	XXXX	XXXX	.	XXXXXXX		XXXX	XXXX	.	.	.	.	XXXXXXXXXXXXX		.	.	XXXX	.	XXXXXXX	.	XXXXXXXXXXXXXX			
4029	XXXX	XXXX	.	XXXXXXX		XXXX	XXXX	.	.	.	.	XXXXXXXXXXXXXXXXXX		.	.	.	.	XXXXXXX	.	XXXXXXXXXXXXXX			
4263	XXXX	XXXX	.	XXXXXXX		XXXXXXXXXX		.	.	.	.	XXXXXXXXXXXXXXXXXX		.	.	.	.	XXXXXXX	.	XXXXXXXXXXXXXX			
4573	XXXX	XXXX	.	XXXXXXX		XXXXXXXXXX		.	.	.	.	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX												
4957	XXXX	XXXXXXXXXXXXX				XXXXXXXXXX		.	.	.	.	XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX												
5856	XXXX	XXXXXXXXXXXXXXXXXXXXXXXXX										XXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXXX											
9084	XXXX	XXXXXXXXXXXXXXXXXXXX

It might have been expected that Preceptor profiles would cluster with other Preceptor profiles. To some extent this did occur. PDA12 and PDA09 formed an early cluster which later formed a new cluster with PDA10. This latter cluster then formed a new cluster with PDA06 and FDA09, which also put the two site 09 profiles together. In this five member cluster were four of the eight (50 percent) original Preceptor profiles and within the cluster itself they accounted for 80 percent of its identity.

Interestingly enough, however, only one of the five dental hygiene Faculty profiles (DH08) ever clustered with any of the Preceptor profiles, and as will be recalled from Table 17, DH08 clustered with the dental assisting profiles long before it eventually was clustered with other dental hygiene profiles. These findings may suggest that the dental assisting Preceptors had little trouble in distinguishing between those tasks which they feel are "dental assisting" oriented and those which are not dental assisting oriented.

CHAPTER V

SUMMARY, DISCUSSION, AND CONCLUSIONS

Restatement Of The Problem

This study was designed to develop a dental task performance methodology which may be applied both to educational programs preparing dental auxiliaries and to dental practices utilizing dental auxiliaries. It was the intention of the study to develop a package of instruments which could be used, in the future, to relate the content of the educational programs to the delegation and allocation of dental and dental-related tasks in the world of dental care practice in such a way that a linkage could be made between educational preparation and work assignments on-the-job. A further intention of the study was to attempt to determine those differences among the educational institutions and their educators which may account for the varying numbers and kinds of tasks taught as well as the range of levels of responsibility at which the tasks are expected to be performed at the time of the student's graduation.

Sample

The sample in this study was comprised of nineteen accredited dental auxiliary education programs (ten dental assisting programs, seven dental hygiene programs, and two dental laboratory technician programs) located in community colleges, technical institutes, and universities in a midwestern state. Those faculty members in the educational programs identified as actually teaching dental tasks were selected as respondents and were subsequently identified as the Faculty and the Preceptors.

Procedures

In a structured interview, Faculty and Preceptors were asked to respond to a Dental Task Inventory (DTI) questionnaire consisting of two parts: (a) a biographical data section, and (b) a list of 623 dental task statements (563 originals and 60 exact duplicates). In the task list section of the DTI, the respondents were asked to identify (1) the level of responsibility (competency) to which they taught the task, and (2) the cumulative time spent teaching each dental task.

Collected data were key punched, cleaned and edited, and analyzed to (a) establish the reliability of respondent's responses, (b) determine the degree of content validity associated with the dental task statements and the responses to them, (c) identify selected characteristics of the auxiliary programs and their Faculty which may be related to identified differences among the programs, (d) determine the differences in the level of responsibility to which dental tasks are expected to be performed at the time the auxiliary student graduates, and (e) measure of similarity or "interchangeability" of the task content in the three dental auxiliary curricula.

Findings

Reliability Of Dental Auxiliary Educator's Responsibility Responses

Considering the total number of task statements in the DTI, it was found that for all questionnaires returned there was a mean response rate of 98 percent to all task statements.

To explore the question of response reliability, sixty task statements were randomly selected from the dental task inventory and randomly placed among the randomly listed statements from which they were drawn. The respondents'

responses to the duplicate pairs of statements were then analyzed for response stability.

Considering all respondents as a group, the analysis for response stability indicated a high level reliability. Seventy-three percent of all individuals who responded to 95 percent or more of the paired statements had absolute agreements. Seventy-nine percent of all respondents made identical responses to at least 86 percent of the duplicate pairs regardless of the number of pairs to which they responded. By type of respondent, the Faculty tended to display greater overall stability to the duplicate items than did the Preceptors. With such a high stability rate over all Faculty respondents, it was not considered necessary to make an analysis of possible rate differences among Faculty respondents from each auxiliary.

Faculty respondents tended to have less difficulty with response stability than did the Preceptors, but the Faculty had more difficulty making a decision of/about whether or not they teach the task than did the Preceptors. The Preceptors on the other hand, had relatively more difficulty determining to which level they taught the task. These findings may indicate, as Christal (1973, p. 5) found,

> that, while being honest, many [respondents] will give themselves the benefit of the doubt. For example, a [respondent] might claim to perform [teach] a task when, in fact, he only performs [teaches] part of the task. This is one of the problems with statements which are too broad, and it helps to explain why our inventories now have over 500 task statements.

The absolute agreement response stability among the sixty paired responses of the Faculty and Preceptors together was lower among the compound task statements (two or more related tasks in a single statement) than it was among the simple task statements. About one-third of the duplicate pairs were compound

statements (21 statements), and one-third of these had less than 86 percent exact agreements, considering the Faculty and Preceptors responses together. Only three percent of the simple task statements had less than 86 percent exact agreements.

Validity Of Dental Task Inventory Time Responses

Neither the Faculty nor the Preceptors were able to provide reliable responses to the question in the DTI questionnaire designed to elicit cumulative time spent teaching each task. Indeed, few of the Preceptors were able to even respond to the question and many of the Faculty indicated by notes in the questionnaires and by telephone interviews to the study staff that they were having difficulty providing meaningful responses. These findings are corroborated by those of Christal (1973, p. 6), "Research indicated that many workers do not have a clear idea of the exact percentage of their time devoted to each task they perform." After reviewing the responses, discussing the returns with the respondents, and attempting to make frequency tallies, no attempt was made to make further analysis of the time data.

The Auxiliary Education Programs

Institutions And Their Programs - The dental assisting and dental hygiene programs were found in three types of post-secondary educational institutions: community colleges, technical institutes, and universities with schools of dentistry. The dental laboratory technician programs were located in a community college and in a technical institute. The dental assisting programs were all identified as certificate level programs with a mean program length of 33 weeks. The dental hygiene programs were identified as either "two year" certificate and Associate Degree level programs or as "four year" Baccalaureate Degree level

programs. The two-year programs had a mean program length of seventy weeks while the latter had a program of 128 weeks.

Faculty and Preceptors - The dental assisting programs in the community colleges had a mean identified Faculty size of 3.9 while those in the dental schools had a mean identified Faculty of 9.0. A similar difference was found between the community college and dental school based dental hygiene programs where there was a mean identified Faculty size of 5.6 and 11.0, respectively. The increase in the number of identified Faculty in the dental schools was most likely a result of their immediate proximity to the dental school faculty members who were available for part-time teaching assignments in the auxiliary education program.

Preceptors were utilized in nine of the ten dental assisting programs and in two of the seven dental hygiene programs. The number of Preceptors varied by program, as did the types of dental practices they represented. It was found that every student in each auxiliary education program was, as a rule, taught by every Faculty member, but all students were not necessarily scheduled through all Preceptors or through all dental practice specialities.

The Faculty in all auxiliary programs tended to be young -- in years of age, in years of professional work experience, and in their current job titles. The Faculty with dental auxiliary preparation tended to cluster around 24-25 years of age while the dentists among the Faculty tended to move the mean Faculty age up to 32-33 years. On the average, over fifty percent of all Faculty and over 72 percent of the dental auxiliary prepared Faculty had five years or less of professional work experience prior to assuming their current job title. Over 91 percent of all Faculty members had held their current job title five years or less. Ninety-four percent of all dental assisting Faculty members and

95 percent of the dental school based dental hygiene Faculty members had held their current job titles five years or less. These percentages appeared to be high despite the finding that 47 percent of all auxiliary programs in the study had been in existence no more than five years.

All Faculty with dental assisting and dental hygiene professional preparation were females, while among the dentists of the Faculty members there was but one female. All dental laboratory technician Faculty were males. There were no minority ethnic groups represented among the Faculty with dental assistant, dental hygiene, or dental laboratory professional preparation. Among the dentists there were three Oriental and one American Indian Faculty members.

Except in the two cases where an auxiliary Faculty member had professional preparation as both a dental assistant and a dental hygienist, there were no auxiliary programs in which a dental assistant or dental hygienist was employed as a member of the Faculty in the opposite program. There was a sharing of Faculty, however, in three institutions which had both a dental assisting and a dental hygiene program.

Twice as many of the dentists on the auxiliary education Faculties had received their primary dental preparation in the state in which they were currently teaching as had received it in other states. The Faculty with professional auxiliary preparation, on the other hand, were about evenly divided between those who had received their educational preparation in the state in which they were teaching or elsewhere.

Implications of certain of these findings, as they relate to similarities and differences among the task content of the curricula of the three dental auxiliary education programs, will be discussed in the following section.

Task Content Of Auxiliary Curricula - The respondents were asked to indicate,

for each dental task in the Dental Task Inventory, the responsibility level to which they taught the task: (1) not taught, (2) student will be able to perform the task, but only under direct supervision, (3) student will be able to perform the task with shared responsibility, or (4) student will be able to perform the task with independent responsibility. With each Faculty member, and Preceptor, answering for only those tasks which he or she taught or for those which were taught under his or her direct responsibility, and with the finding that essentially every student in each program was taught by every Faculty member in the program (not so for Preceptors), it was concluded that a profile of the task content of the curriculum of each auxiliary program could be developed from the cumulative responses of the Faculty members in each program. This was accomplished by utilizing the highest responsibility response to each task from any one or more of the program's Faculty. This method has its limitations (e.g., statistically, extremes usually have greater variance than means); however, it was also to be recognized that each respondent was responding to what he or she actually taught or for that which was taught under his or her direct responsibility. This would suggest that the responses would have greater validity than if each respondent had been asked the question, "What do you understand the task content of this curriculum to be." To use the latter responses to determine the task content from which to construct a task content profile of the curriculum would undoubtedly result in a distortion of the content profile due to "estimates" or "understandings" by Faculty members who were not actually knowledgeable about some areas of the curriculum.

Using, therefore, the program profile constructed for each program, a series of analyses was conducted to identify certain differences, and similarities, among the nineteen auxiliary education programs. In addition to constructing

the individual program profiles, composite profiles were similarly constructed for the auxiliaries by institutional setting and by educational completion level. The following findings were based on each of these profiles.

Dental Assisting Programs - In general, there was a strong indication that the Preceptors taught at least as many and in some cases more tasks than the Faculty, and that the Preceptors taught the tasks to as high or higher responsibility levels than did the Faculty. There was, however, a very high correspondence between the total number of tasks identified as being taught by the Faculty and by the Preceptors in the nine dental assisting education programs utilizing Preceptors. In general, neither the Faculty nor the Preceptors made much use of the "2" (student will be able to perform the task, but only under direct supervision) responsibility level.

These findings for the Preceptors were interesting in two respects: (a) the Preceptors have their students for just two to four weeks, and (b) they teach and expect that the student within that time will be able to perform many tasks and to a high level of responsibility. The Preceptors as well as the Faculty, however, were able to discriminate among the tasks in identifying those procedures or functions (tasks) which the students were taught to perform. For example, when the tasks were sorted by categories, it was very evident that the dental assisting Faculty and the Preceptors had identified as being taught to the "3-4" (shared or independent) responsibility levels only one or two tasks from the category "Patient Care (PC): Preparations" and a similarly small number from the category "PC: Surgery and Surgically-Related." These categories include tasks that few dentists are willing to delegate, according to preliminary findings of the Marcus study at UCLA.

There were very few differences between the combined Faculty profile for the community college based dental assisting programs and for the dental school based dental assisting programs. Two categories: 7(PC: Preparations) and 9(PC: Surgery and Surgically-Related), were found to account for essentially all of the differences between the two profiles. In these two categories the great majority of the community college Faculty responses were "2" level responses while in the dental school Faculty responses were "NR-1" (not taught) responses. It is suspected that the community college Faculty were really indicating in these categories that they "assist" in these tasks rather than "perform the task under direct supervision."

In looking further at specific categories of tasks it was noted that in only two categories (Housekeeping, and PC: Records) was there very high Faculty agreement among all dental assisting programs that essentially all tasks in the DTI were being taught to the "3-4" responsibility levels. As previously noted, the Faculty responses to the tasks in categories PC: Preparations, and PC: Surgery and Surgically-Related were to the effect that they were not taught. Similar findings, although to a lesser extent, were noted in categories PC: Analysis, Treatment Planning, and Consultation; and in PC: Anesthesia and Medications. It was noted that if a student were to have enrolled in every dental assisting program, he or she would have been taught to the "3-4" responsibility levels at least 87 percent of the tasks in eleven of the fourteen categories.

Dental Hygiene Programs - Two dental hygiene programs utilized Preceptors in their programs; however, since data were collected from the Preceptors of only one program, Faculty and Preceptor response comparisons were not considered

appropriate for reporting in this study. Using the Faculty responses, comparisons were made among the seven dental hygiene programs studied. As in the dental assisting programs, there was nearly unanimous Faculty agreement that essentially all tasks were taught and taught to the "3-4" responsibility levels in categories 2 (Housekeeping) and 3 (PC: Records), and in addition category 6 (PC: Preventive and Patient Education) was noted for the dental hygiene programs. Category 5 (PC: Analysis, Treatment Planning, and Consultation) indicated more tasks were taught to the "3-4" responsibility levels by the dental hygiene Faculty than by the dental assisting Faculty. Again, as in the dental assisting responses, the number of dental hygiene Faculty "3-4" responses were relatively few in categories 7 (PC: Preparations), 8 (PC: Anesthesia and Medications) and in 9 (PC: Surgery and Surgically-Related).

The "2" responsibility level (graduate will be able to perform, but only under direct supervision) was rarely used by the dental hygiene Faculty. Evidently, in this auxiliary, tasks are taught to the "shared or independent" responsibility levels or they are not taught.

If a student had been enrolled in every community college or technical institute dental hygiene program, he or she would have been taught to the "3-4" responsibility levels at least 85 percent of all tasks in eight categories. This was three fewer categories and two percent fewer tasks than was reported for similar analysis of the dental assisting Faculty responses. If a student had been enrolled in the two-year dental school based dental hygiene programs (one program reported), he or she would have been taught, to the "3-4" responsibility levels, at least 85 percent of only four categories. In the four-year dental hygiene program, however, 85 percent of the tasks in eleven categories

are taught to the "3-4" levels of responsibility.

Dental Laboratory Technician Programs - Only two dental laboratory technician education programs were included in the current study. Their Faculties responded quite unanimously to only one category (PC: Dental Laboratory) in which at least 85 percent of the tasks were taught to the "3-4" responsibility levels. In ten categories, the combined Faculty responses indicated that not more than one-third of the tasks were taught to the "shared or independent" responsibility levels.

In the dental laboratory technician programs, as in the dental hygiene programs, the Faculty tended not to use the "2" level responsibility response. Only two tasks in the entire inventory received a "2" response. The two dental laboratory technician programs had very high correspondence between their Faculty responses to each category of tasks. There were only twelve tasks in the entire Dental Task Inventory to which they did not agree at the "3-4" responsibility response levels.

Additional Program Comparisons - Although it was expected that the dental assisting Faculty would make use of the "2" responsibility level response, it was not expected that much use of this response level would be found among the dental hygiene programs; this expectation was confirmed by the findings. There was, however, more use of it than might have been expected. Six categories: 5 (PC: Analysis, Treatment Planning, and Consultation), 8 (PC: Anesthesia and Medications), 9 (PC: Surgery and Surgically-Related), 11 (PC: Dental Laboratory), 12 (PC: Insertions and Restorations), and 13 (PC: Adjustments and Repairs), were found to have the greatest number of "2" level responsibility responses

from the dental hygiene Faculty. These are categories of work in which it has been more traditional for the dental assistant to be performing the tasks at this responsibility level.

A very high correspondence was noted between the "all programs" profiles (cumulative for each auxiliary) of the dental assisting and dental hygiene programs. In fact, 88.5 percent (498 tasks) of the tasks in the Dental Task Inventory received identical Faculty responses when these two profiles were compared; i.e., based on these two profiles, there were only 65 tasks left on which to differentiate the preparation between these two auxiliaries. There was little correspondence between either the dental assisting or the dental hygiene profiles and the dental laboratory technician profile except in category 11 (PC: Dental Laboratory) where the correspondence was very high in both comparisons.

Using the "community college" profiles for the two auxiliaries, there were 378 tasks (67.1 percent) which evoked identical responses by the Faculty from both auxiliaries. The "all programs" and the "community college" dental assisting profiles and both of the respective dental hygiene profiles were compared with the dental laboratory technician profile and in each comparison there were approximately 200 tasks with identical responsibility responses in each comparison.

Hierarchical Clustering Scheme To Compare Programs - A Hierarchical Clustering Scheme (Johnson, 1967) permitted comparisons among the nineteen auxiliary education programs based on their Faculty response profiles to the 563 dental tasks identified in the Dental Task Inventory. Each combination of two programs were compared by summing the squared differences between their responses to each

of the task statements. These comparison values were then used to identify those programs with the least difference between their task responses as identified in the programs' profiles. Using that pair of programs with the "least distance" between programs, the remaining program comparisons were again considered among themselves and considered with the first cluster to identify either the next program to be added into the first cluster or to identify another cluster by determining the next order of least distance among the comparisons. In this manner a hierarchical clustering of the nineteen programs was developed which identified those programs which had similarities between or among them.

In reviewing the hierarchy of program clusters derived from the nineteen auxiliary programs utilized in the study, it was apparent that the dental assisting programs were of two types or kinds, each of which was more similar to the majority of the dental hygiene programs than they were to each other. One dental hygiene program and one dental assisting program (each from the same institution) appeared to be extremely similar, even more so than were the two dental laboratory technician programs similar to each other. A second dental hygiene program clustered very early with one of the two dental assisting groups indicating that it was more like those dental assisting programs than it was like five other dental hygiene programs.

The dental hygiene and dental assisting programs which formed the first cluster were located in the same institution and some of each program's Faculty participated as members of the other program's Faculty. Since each Faculty member was asked to respond for each program in which they taught, it was possible that either (a) these two programs were as similar as they were reported to be, or (b) that the respective program's Faculty could not maintain each program's identity as they responded to each of the inventories. The latter

alternative seems questionable since in other similar circumstances of shared Faculty such close correspondence was not reported.

In a second clustering analysis using seventeen of the programs (the dental assisting and dental hygiene programs noted above were excluded), there continued to be a division of the dental assisting programs into two groups. The one dental hygiene program continued to cluster with one of the dental assisting groups. As in the first clustering analysis, the dental laboratory technician programs formed an early cluster which continued as a single identity until very late in the clusterings.

A third hierarchical analysis was developed using just the fifteen dental auxiliary programs found among the community colleges and technical institutes. Again two types of dental assisting programs were identified indicating that it was not the effects of the dental assisting and dental hygiene programs in the dental schools which created this particular schema. The unique dental hygiene program continued to cluster with the dental assisting programs and the dental laboratory technician cluster maintained its integrity until very late in the clusterings.

In the final hierarchical clustering analysis of this study, the fifteen community college and technical institute Faculty profiles were used and in addition the Preceptor profiles for the nine dental assisting programs were added. In this analysis the Preceptor profile for one program clustered very early with the respective Faculty profile from the same program. In another cluster, which occurred later in the clustering, another Preceptor profile clustered with its respective Faculty profile but only after it (the Preceptor profile) had previously clustered with another Faculty profile. There was a distinct tendency for the remaining Preceptor profiles to cluster among themselves rather than to cluster early with their Faculty profiles.

Discussion

The methods of task analysis have been applied in this study to determining the selected task content of three dental auxiliary education programs. The Dental Task Inventory questionnaire developed as the instrument for data collection was designed following the recommendations for developing task inventories suggested by Christal (1973). As Christal had suggested, it was found that valid and reliable data could be collected using a task inventory instrument containing task statements written by experienced and qualified task inventory writers, and where the statements were written as specific task statements, rather than as broad task statements. This latter point was adequately demonstrated in the current study by the inability of either the Faculty or the Preceptors to provide as reliable (stable) responses to a number of compound task statements included in the DTI instrument as they did to the simple statements.

The number of task items (623) in the DTI was not in itself a negative factor in the collection of data, although the large number of duplicate task statements included in the Inventory was a disturbing factor to the respondents. The questionnaire return rate of more than 95 percent for the Faculty and nearly seventy percent for the Preceptors indicated, however, that

(a) When the instruments are personally distributed,

(b) When there is an adequate interview with the respondent at the time the instrument is distributed, and

(c) When there is the guarantee of the educational program receiving a feedback report of the findings for their program,

there is an excellent probability of this being an acceptable type of research activity by the intended respondents. The mean rate of 98 percent completion of all task statements in the returned questionnaires offered added weight to the defense of the method.

It was evident from the findings that the Dental Task Inventory will have

to be revised. The compound task statements will have to be identified as single, specific task statements and other statements will have to be scrutinized for evidences of the respondent's difficulties with the items. This suggests, as Christal (1973) notes, that task inventories tend to be lengthened as more reliable data is sought. It will be necessary, therefore, to identify the parameters by which the revised DTI instrument will be developed.

The work of Christal (1973) suggested that respondents should be asked if they perform a task as opposed to how frequently do they perform a task. In developing the methodology of this study, the emphasis was placed not only on whether the task was taught, as Christal had suggested, but also on the responsibility level to which the graduate was expected to be able to perform the task. Considering that the dentist is more likely to delegate or allocate tasks (functions or procedures) to those auxiliaries with adequate preparation, it appeared that a measure of preparation was required; one that could also be used in describing tasks performed, and by whom, in the delivery of dental services. Tomlinson's (1969, p. 121) responsibility level scale was adapted to this study and was found to be acceptable to the respondents. In addition, it was found that the respondents could, for the most part, identify sufficiently with the levels of responsibility to discriminate among the tasks.

A difference was noted between the Faculty and the Preceptors, however, which indicated the two respondent groups had different kinds of problems in using the responsibility levels to discriminate among the tasks. In the reliability (stability) analysis it was found that the Faculty had more difficulty than did the Preceptors in deciding whether or not they taught a task. On the other hand, the Preceptors were found to have greater difficulties determining to which level they teach a task.

These findings for the Faculty may indicate that the task statements were too broad in scope and that while the Faculty did teach some aspect of the task identified by the statement, they did not teach all of the task statement's content. This would likely be the case for those responses which were of the "1-3" type (not taught - will be able to perform task with shared responsibility) or of the "1-4" type (not taught - will be able to perform the task with independent responsibility). On the other hand, it may be that the Faculty had not been teaching in the programs long enough to immediately recognize every task which they may teach. It was found, for example, that over all Faculty members, 91 percent had held their current position five years or less and that in several programs the figure rose to 94 and 95 percent.

It was considered that the Preceptors had a different type of problem than did the Faculty as they tried to discriminate among the tasks using the responsibility level scale. The Preceptors, unlike the Faculty, see but one, or perhaps two students at a time, and very seldom, if ever, does any one Preceptor see every student in the criterion class from which the students come. These circumstances place the Preceptor at the disadvantage of having to identify with a very few students, often no more than two or three, as he or she decides on the level to which a task is taught. Indeed, many Preceptors indicated such would be the case in the initial interview with them. Many of the Preceptors also indicated during the interview that they tend to let the students do those tasks which they let their employed auxiliaries perform. This latter comment may suggest that the Preceptors had the additional difficulty of maintaining an identity with the students as opposed to the employed auxiliaries as he or she responded to the DTI questionnaire.

Before turning to a discussion of the task analysis findings, it should be noted that certain transformations of the data were completed prior to making

the analyses. As has been noted earlier, one of the objectives of this study was to determine from the task content of the educational curricula those tasks which were being taught to levels of responsibility such that the dentist could delegate or allocate a task(s) and thereby be freed to perform other tasks or procedures. For those tasks which may be delegable under the above circumstances, the dentist may choose to initiate certain procedures under his own direction and subsequently delegate certain tasks associated with the procedure so as to share the responsibility with a dental auxiliary. On the other hand, the dentist may delegate certain tasks to be performed with somewhat independent responsibility. In both cases, however, the dentist has delegated a task or function of sufficient scope of activity and which requires enough time that he or she may be performing other procedures (including being physically away from the office or practice).

The above concept led the study to combine Faculty and Preceptor responses to the "3" (shared) and "4" (independent) levels of responsibility used in the DTI questionnaire to form a single "3-4" level. This combined level of responsibility was considered to be reflective of a level of educational knowledge and skill sufficient that the dental auxiliary could perform the task (function) to the level of proficiency and quality expected of the dental profession. The combined level was then used throughout the analyses conducted during this portion of the study. Later analyses will be performed using the original data responses so that additional precision may result from the analyses.

The findings of the task analysis among the nineteen dental auxiliary education programs indicated, as has been noted, that both Faculty and Preceptor respondents were able to provide highly stable (reliable) results to sixty duplicate task statements placed in the DTI questionnaire. In addition, it was noted that there was a very high correspondence between the Faculty and Preceptor

responsibility level responses at both the task and at the category levels of analysis; i.e., as the Faculty responses tended to indicate that a task was not taught, the Preceptor's responses tended to indicate the same thing. These findings provided a measure of validity to the responses. There was, however, a decided tendency over all Preceptors to indicate that they taught more tasks and taught them to a higher level of responsibility than did the Faculty.

In comparing the combined Faculty dental assisting profiles between the community college and the dental school based programs, there was a decided trend for a higher percent of "3-4" responses from the latter programs. These profile findings were supported by the findings that the actual number of Faculty responses at the "3-4" level of responsibility was higher among the dental school based programs. In two categories: 7 (PC: Preparations) and 9 (PC: Surgery and Surgically-Related), however, there was a decided indication from the dental school based programs that tasks in these categories were not taught as opposed to the community college based dental assisting programs indicating that these categories of tasks were taught to the "2" level of responsibility. This may have been a case where the latter programs were saying the student will be involved as opposed to the student will be able to perform the task but only under direct supervision. Why this difference was so marked is worthy of further investigation. As a last point in these comparisons, it was noted that the responses from one of the dental school based dental assisting programs added very significantly to the "all programs" profile while the other dental school based program responses were as conservative as many of the community college based programs. The later program may be indicative of the findings of Diefenbach (1969, p. 3) regarding the resistance of dental school faculties to change, or it may be more of a reflection on the small number of dental school based programs included in the study, for there are reasons

to believe that some dental schools are in the forefront of developing expanded duty auxiliaries.

The findings of the task analysis indicated that over all dental assistant and dental hygiene programs, there were few differences in the two auxiliaries as viewed by the number of tasks taught or the responsibility levels to which the tasks were taught. Indeed, there were 498 tasks in the DTI to which one or more individual programs in each of the two auxiliaries indicated exact agreement. These findings would indicate that the curricula for these two auxiliaries are very similar if taken over a large number of programs. It was particularly of interest to note the relatively large number (although it was proportionately small) of tasks taught to the "2" level of responsibility among the dental hygiene programs, particularly in those areas that are more traditionally considered to be performed by dental assistants.

The dental laboratory technician programs were decidedly oriented towards fewer tasks than were either the dental assisting or the dental hygiene programs. There was, however, little tendency of the dental laboratory technician Faculty to use the "2" responsibility level response. One interesting point regarding the dental laboratory technician findings was that about a third of all the tasks in each category were taught to the "3-4" responsibility level. Further studies of these explicit tasks may indicate that these auxiliary educators are preparing their students to assume a broader role in the performance of dental services than they have assumed in the past.

Studies by Brearly (1972) and others have indicated that recent graduates of conventional dental assisting education programs are capable, after an additional twelve-weeks of training and some additional in-service practice, of performing certain dental procedures both as quickly and with as high a level of quality as were senior dental students, and that as a group, the auxiliaries

were significantly superior to the dental students in the performance of some procedures. These findings may help to explain the findings of this current study in which so many of the Faculty and Preceptor respondents indicated such a large number of tasks being taught and taught to "shared or independent" levels of responsibility. One Preceptor's response to a question posed in an interview regarding the opportunity for the students to get experience in "expanded functions" during their preceptorship in the office was typical of many responses from very progressive practitioners. The Preceptor responded, "We have a full-time dental assistant in the office who can carve and polish amalgam restorations as well as any dentist in this city and she performs essentially all of them done in this office. When we get a student who shows the least interest in such procedures and who exhibits some confidence in herself, we give her (sic) plenty of opportunity for experience in certain procedures."

There were few differences reported among the variables utilized in this study to identify those characteristics of the institution, the program, or the Faculty, which may have accounted for the variance among responses to the Dental Task Inventory. There was an indication that dental school based auxiliary education programs may have larger numbers of Faculty, and this may explain why some dental school based programs teach more tasks and to a higher level of responsibility. The findings were not completely substantiated, however, since some community college based dental assisting and dental hygiene programs with small numbers of identified Faculty taught as many tasks and to high levels of responsibility as did the dental school based programs. Future attempts to identify the right variables may want to consider the areas of policy makers, philosophy, and the intents of the programs.

Conclusions

A number of findings were set forth throughout the preceding sections of this chapter. Several of these findings appear to be conclusive, but a number of others must be considered somewhat tentative in that this study was conducted with dental auxiliary education programs from a single state. Based on the findings of the study, however, the following statements are considered to be reasonable and are presented as principal conclusions of the study:

The methodology developed in this study provided a mechanism for collecting the data required to identify, (a) a selected portion of the task content of accredited, post-secondary dental auxiliary education programs, and (b) the level of responsibility (competency) to which the programs' graduates are expected to be able to perform the identified tasks;

The methodology provides a mechanism for collecting data regarding the tasks taught in the offices, clinics, and practices of practicing dentists serving as auxiliary Preceptors, and, thereby, served to identify certain tasks delegated or allocated to dental auxiliaries in the delivery of dental care services;

The methodology developed in this study is capable of providing an interface between the world of work in many occupations and professions and the educational programs preparing individuals to work in the respective occupations and professions.

The Dental Task Inventory (DTI) questionnaire consisting of over 600 task items was acceptable to both Faculty and Preceptors teaching dental tasks if (a) personally distributed by the research staff, and (b) a feedback report is promised and provided;

The responsibility scale: (a) graduate will be able to perform the task, but only under direct supervision; (b) graduate will be able to perform the task with shared responsibility; and (c) graduate will be able to perform the task with independent responsibility, utilized with the DTI questionnaire has validity for both Faculty and Preceptor members of a dental auxiliary education program;

The DTI was sufficiently sensitive to identify gross and subtle differences in the task content of auxiliary education programs both within a dental auxiliary and among dental auxiliaries;

Across the curricula of all dental assisting programs, there were few differences in the number of tasks taught and in the levels of responsibility to which they were taught relative to the curricula of all dental hygiene programs;

The fourteen categories identified for grouping the task items by types of dental procedures (functions) were a valid set relative to both curriculum content and to dental care services performed in the world of work;

Except for those tasks in the categories of "Preparations" and "Surgery and Surgically-Related," a major number of the tasks identified in the DTI could be delegated to appropriate individuals from either the dental assisting or the dental hygiene auxiliary education programs;

The Preceptors in dental assisting education programs indicated they teach more tasks and to a higher level of responsibility than do the Faculty members from the same auxiliary;

The hierarchical clustering scheme served as a method to identify, from empirical measures, the similarity of relationships among the individual educational programs of the three dental auxiliaries as well as the similarity of the three types of auxiliaries;

The cumulative time spent teaching <u>each</u> task in a curriculum cannot be meaningfully reported by Faculty or Preceptor respondents using a scale of hours;

Recommendations For Further Research

The following recommendations are suggested for consideration in further research:

The institutional and biographical instruments used in the study should be reviewed in an attempt to identify factors which may contribute to differences in the task content of the various auxiliary curricula; for example, it may be that by identifying the relative involvement of full-time and part-time Faculty that greater differences may be found in the number of tasks taught and the responsibility levels to which they are taught;

A question and response scale might be developed to identify the program faculty's philosophy towards (a) the state's dental practice act, (b) preparing students for employment only within the state in which the program is situated, and (c) degree of support of a high level of delegated tasks to dental auxiliaries;

The Dental Task Inventory should be scrutinized to identify those tasks which are stated in terms which are too broad and those which are constructed as compound task statements; these should be rewritten to make them specific to the performance of a single task which when considered alone or with other tasks may constitute a procedure which could be delegated or allocated to the dental auxiliary;

All tasks should be checked against additional task statements identified in the current literature to identify possible omissions and to identify possible refinements to the present task statements (for example, U.S. Air Force, 1973a, 1973b);

In consideration of the findings of Christal (1973), consideration should be given to:

(a) identifying task statements which are sufficiently specific in content so as to lessen the problem of having to respond to a task statement although a faculty member teaches only a portion of it,
(b) placing the tasks in the questionnaire by category rather than in random order, and
(c) requiring the respondent to actually mark only those tasks which he or she teaches;

Since it is anticipated that the Dental Task Inventory instrument will be usable for collecting task data from employed workers in the occupation and from educators in dental auxiliary education programs, the task inventory should be biased in its content to include only those tasks which have (a) a training or educational

content and (b) a significant element of delegability associated with them; e.g., housekeeping type tasks might be deleted;

In responding to the DTI questionnaire, respondents should be asked to respond to only those tasks which they either teach, or do on the job, which would allow for the creation of an expanded and more complete task inventory (see Christal, 1973);

Consideration should be given to whether a single or a double response should be asked for each task statement; if a second question is to be asked, it is recommended that the dentist Preceptor be asked: Do you currently delegate or have you allocated this task to any dental auxiliary in your practice, and if so, to what responsibility level have you delegated or allocated it to be performed; to the Faculty (the Faculty with dental auxiliary preparation) and to the Preceptor's employed dental auxiliary staff (who were discovered also to be teaching in the Preceptorship) the question would be: Is this task currently delegated or allocated to you, and if so, to what responsibility level do you routinely perform it (these questions and responses can then be related directly to the work of Dr. Marcus at UCLA);

The definitions for the responsibility levels should be evaluated to determine their sufficiency; it may be appropriate to add examples of the manners in which they might be used in order to further clarify their intended meaning; the "2" responsibility level statement on the fold-out above the task statements should be expanded to include the wording "assist with" as it was used in the full description of the level in the forepart of the DTI questionnaire;

The study should be extended to the collection of data from variously oriented dental auxiliary education programs and from selected military education programs to allow for further comparisons by types or kinds of programs.

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APPENDIX A

DENTAL TASK INVENTORY QUESTIONNAIRE

(AN EXAMPLE)

O.M.B. NO. 68-S73031
APPROVAL EXPIRES JULY 31, 1973

DENTAL AUXILIARIES EDUCATION STUDY

Inventory For CERTIFICATE DENTAL ASSISTANT Program

Bureau of Educational Research
University of Illinois at Urbana-Champaign
Urbana, Illinois 61801
Phone 217-333-1450

Rupert N. Evans, Principal Investigator
David R. Terry, Project Director
Robert M. Tomlinson, Consultant
Michael J. Noe, Research Associate
Marilynn R. Reasor, Research Associate

DENTAL AUXILIARIES EDUCATION STUDY

FACULTY/ADMINISTRATOR DATA FORM

FACULTY/ADMIN. NUMBER __ __ __

ASSIGNMENT CODE __/__/__

SITE NUMBER __ __ __

SKILL CODE __ __

What is your speciality in the dental field __ _____

Dent. Aux. Program(s) currently assoc. with	Current Job Title(s) in program(s)	How Long In Program(s) From Mo	From Yr	To Mo	To Yr
_____	_____	__	__	__	__
_____	_____	__	__	__	__
_____	_____	__	__	__	__

Educational Institution in which you spend majority of your time _____

Location of Institution

City _____ State _____ Zip _____

Your Name _____

NOTE: IF YOU HAVE PREVIOUSLY FILLED OUT THE FOLLOWING DATA PAGES, PLEASE TURN TO PAGE 6.

ABOUT YOUR BIOGRAPHICAL DATA:

1. BIRTHDATE __Mo__/__Da__/__Yr__

2. SEX

   1. Male
   2. Female

   _____ No. Code

3. RACE

   1. American Indian
   2. Black/Negro
   3. Oriental
   4. Spanish Surname
   5. White
   6. Other

   _____ No. Code

4. MARITAL STATUS

   1. Never Married
   2. Now Married
   3. Other

   _____ No. Code

ABOUT YOUR CAREER:

5. How long have you been employed in this educational institution?

   From __mo__-__yr__ To __mo__-__yr__

6. What was the last salaried, health-related job (excluding educational program) held prior to joining this educational institution?

   a. Job Title

   _____

   b. Dates of Employment:

   From __-__ To __-__

7. What was the last nonhealth-related job held prior to joining this educational institution?

   a. Job Title

   _____

   b. Dates of Employment:

   From __-__ To __-__

ABOUT YOUR EDUCATION:

8a. What is the highest level of formal academic (not including technical/occupational) education that you have completed?

No. Code

(CHOOSE ONE CODE NUMBER FROM LIST)

01 Did not complete high school

02 Graduated from a high school program

03 Received high school diploma by GED exam

04 Freshman year of college or junior/community college

05 Sophomore year of college or junior/community college

06 Received an associate degree

07 Junior year of college

08 Received a bachelors degree

09 Attended graduate school but did not earn a degree

10 Received a masters degree

11 Did course work for doctorate but did not earn a degree

12 Received a doctor degree (PhD, EdD, etc.)

13 Received a health profession doctorate (MD, DDS, etc.)

14 Attended post doctoral program

8b. Year you completed the academic program specified above?

1 9 __ __

Year

9a. How much organized or directed technical or occupational preparation have you additionally completed in the health field, if any? (Choose one code from each section.)

MILITARY — No. Code

01 None

02 Up to four months of technical or occupational preparation offered by one of the military services.

03 More than four months and up to one year of technical or occupational preparation offered by one of the military services.

04 Approximately two to three years of technical or occupational preparation offered by one of the military services.

VOCATIONAL OR TECHNICAL SCHOOL — No. Code

05 None

06 Up to four months of technical or occupational preparation offered by a vocational or technical school.

07 More than four months and up to one year of technical or occupational preparation offered by a vocational or technical school.

08 Approximately two to three years of technical or occupational preparation offered by a vocational or technical school.

HOSPITAL OR HEALTH FACILITY — No. Code

09 None

10 Up to four months of technical or occupational preparation offered by a hospital or health facility.

11 More than four months and up to one year of technical or occupational preparation offered by a hospital or health facility.

12 Approximately two to three years of technical or occupational preparation offered by a hospital or health facility.

OTHER THAN ABOVE (SPECIFY) _____ — No. Code

13 None

14 Up to four months of organized short-term preparation plus on-the-job experience.

15 At least one year of informal on-the-job experience.

16. Participated in organized high school preparation program.

17 Other (specify) _____

_____

9b. Year you completed the most recent health-related technical or occupational training specified above.

— 1 9 — — Year

10a. Institution and program where highest level of health-related education was completed (as indicated in questions 8a or 9a):

1. Major area of specialization: _____
2. Type of degree or certificate earned: _____
3. Institution: _____
4. Year Completed: 19__ __
5. Location: _____ / _____
   City State

10b. If you have preparation at two levels or in more than one health-related specialty, indicate the other program (as indicated in question 5a or 6a):

1. Major _____
2. Type of degree or certificate earned: _____
3. Institution: _____
4. Year Completed: 19__ __
5. Location: _____ / _____
   City State

11. Current certifications, licenses or registries held in the health field. (List up to three most appropriate to current position.)

1. Lisc./Cert./Regis.: _____
   By (state(s) or assn.): _____
2. Lisc./Cert./Regis.: _____
   By (state(s) or assn.): _____
3. Lisc./Cert./Regis.: _____
   By (state(s) or assn.): _____

INSTRUCTIONS FOR THE FOLLOWING TASK INVENTORY

As you respond to the two questions regarding each of the following dental task statements, we ask you to consider the following general conditions:

1. You, as a member of the faculty of this dental auxiliary program, are the best judge of the outcomes which you expect to observe in the graduates of the specific dental auxiliary program for which you are responding.

2. We know that many factors are taken into account when any one specific task might take place. These will include the condition of the patient, doctor's direct and/or standing orders, policies of the employing institution, the dental practice act(s), and many other factors. As you respond to each task, you are to consider that all of the above and other conditions would permit your graduates to perform the task to the level of competency that you have prepared them. We want your best judgment of the degree of competency he or she will have to perform the task.

3. There are no "right" or "wrong" responses except as you interpret or reflect your expectations of the graduates of the program. Also, there is no attempt to evaluate you, your colleagues or your institution. All information will be kept confidential.

DEFINITIONS OF RESPONSIBILITY

The levels of responsibility developed for use in this study are defined as:

Direct supervision - Actions of this type include those where your graduate is given a specific instruction to perform an action and report back immediately following its completion, assist a higher level person with the action, or to perform the action under observation.

Shared responsibility - Actions of this type include those where there is some intervening activity by a dentist or other responsible person. This might be a situation where verbal instructions by your graduate's supervisor were given to perform an action where it would not be necessary to report back to the supervisor upon completion of the action. The fact that another person has taken some action relating to the performance at the time of the performance gives them a part of the responsibility.

Independent responsibility - Actions of this type include those kinds of things where your graduate may make an observation during his or her normal duties and/or take an appropriate action without checking with or getting additional instructions from some higher level person. Other situations may be where (a) standing orders, (b) specific instructions recorded on the patient's chart or (c) established policies of the practice site would allow your graduates to perform the task action "on their own." It may or may not include a recording of their action.

THE CRITERION CLASS

The criterion class is that specific, currently enrolled, dental auxiliary class which is nearest to completion or graduation.

INTERPRETATION OF SLASH

As you read each task statement, interpret the slash (/) between two or more words to read "and/or", e.g., Load/unload film cassettes would be read as Load and/or unload film cassettes. If they will perform any part of the statement, you should respond.

TO MARK YOUR RESPONSES

Please turn to the last page of this booklet and fold along the dotted line to flip up the two questions and their respective response scales. Then mark your responses to each task statement by placing a slash mark through the appropriate response number in each of the two columns to the right of each statement.

ADMINISTER TOPICAL MEDICATION, E.G. OINTMENT, SALVE	1234	1234567	339
PREPARE WORK ORDER/WORK REQUEST	1234	1234567	741
ORIENT NEW EMPLOYEE	1234	1234567	642
ADMINISTER LOCAL/TISSUE INFILTRATION ANESTHESIA	1234	1234567	343
ADJUST OCCLUSAL RIM ON PATIENT AND OBTAIN MEASUREMENTS	1234	1234567	1123
MAKE SOLDERING INDEX	1234	1234567	1194
FINISH AND POLISH GOLD FOIL RESTORATION	1234	1234567	1348
RETRACT GINGIVA WITH CORD	1234	1234567	1426
DEMONSTRATE FLOSSING TECHNIQUE TO PATIENT	1234	1234567	1325
PREPARE TOOTH FOR CAST RESTORATION, E.G. FULL CROWN, JACKET, ETC.	1234	1234567	1424
GIVE PHYSIOTHERAPY INSTRUCTION FOR TMJ DIFFICULTY	1234	1234567	1309
DESENSITIZE HYPERSENSITIVE TEETH	1234	1234567	1245
APPLY TEMPORARY SEDATIVE CROWN TO FRACTURED TOOTH	1234	1234567	1292
DIRECT STORAGE/ISSUE/SAFEGUARDING OF SECURITY ITEMS	1234	1234567	680
ADJUST SPACE MAINTAINER	1234	1234567	1306
TRY-IN FULL DENTURE WITH TEETH SET IN WAX	1234	1234567	1351
APPLY PERIODONTAL PACK	1234	1234567	1271
COORDINATE PATIENT TREATMENT PLAN WITH OTHER DEPARTMENTS/AGENCIES/SPECIALISTS	1234	1234567	310
RECORD PROGRESS/THERAPY NOTE ON PATIENT RECORD	1234	1234567	658

PLEASE RESPOND ONLY FOR THE **ASSOCIATE DENTAL HYGIENE PROGRAM**

To what level will the graduate of the program be able to perform this task upon completion of the courses and other learning experiences given by you or under your direct responsibility?

1. Not taught under my direction
2. Will be able to perform only under direct supervision
3. Will be able to perform with shared responsibility
4. Will be able to perform with independent responsibility

How many of the organized hours of instruction in the courses/labs/clinics taught by you or under your direct responsibility are devoted to developing competency in this task?

1. Content relevant to this task not taught under my direction
2. One to 20 minutes of instruction
3. Over 20 minutes and up to 1 hour of instruction
4. Over 1 hour and up to 3 hours of instruction
5. Over 3 hours and up to 6 hours of instruction
6. Over 6 hours and up to 12 hours of instruction
7. Over 12 hours of instruction

APPENDIX B

TELEPHONE AND ON-SITE INTERVIEW FORMS

PROGRAM CODE ____
FTA SITE ____

DENTAL AUXILIARY TELEPHONE INTERVIEW FORM

NAME OF INSTITUTION _____

SUBUNIT OF INSTITUTION _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

OVERALL DIRECTOR OF ALL DENTAL AUXILIARY PROGRAMS FROM WHOM FOLLOWING INFORMATION WAS OBTAINED:

_____ (name)

_____ (address)

AREA ( ) _____ (phone)

Which of the following dental auxiliary programs do you offer and who is the individual in charge of each program?

If certificate and associate programs differ only by the amount of "general education," connect the two response lines with a parenthesis, e.g.,

CERTIFICATE
ASSOCIATE

DENTAL AUXILIARIES	PROGRAM(S) OFFERED (CODE A)	PROGRAM DIRECTOR	TELEPHONE
DENTAL LABORATORY TECHNOLOGY			
CERTIFICATE	(YES) (NO)		
ASSOCIATE	(YES) (NO)		
DENTAL ASSISTANT			
CERTIFICATE	(YES) (NO)		
ASSOCIATE	(YES) (NO)		
BACCALAUREATE	(YES) (NO)		
DENTAL HYGIENIST			
CERTIFICATE	(YES) (NO)		
ASSOCIATE	(YES) (NO)		
BACCALAUREATE	(YES) (NO)		
GRADUATE	(YES) (NO)		

DENT. AUX. TELEPHONE INTERVIEW

PAGE 2

PROGRAM CODE _____

FTA SITE _____

ASSOCIATE DENTAL LABORATORY TECHNOLOGY

INTERVIEWER: READ DEFINITION OF A "CRITERION CLASS."

What is the graduation date of the criterion class of your associate dental laboratory technology program?

_____ (Mo) _____ (Yr)

What is the academic length of your associate dental laboratory technology program? _____

Let's see, that would be equivalent to how many consecutive weeks? _____ Weeks

How many students did you accept into the criterion class of the associate dental laboratory technology program? _____ Students

How many students do you expect to graduate from the criterion class of the associate dental laboratory technology program? _____ Students

In general, what were the admission qualifications for entrance into the criterion class of the associate dental laboratory technology program? (If more than 3, list only 3 most critical.)

1. Req. min. yrs. educ. _____
2. _____
3. _____

Considering the sequence of didactic, laboratory, and clinical practicum in your criterion class of associate dental laboratory technologists, how were these units blocked out? (Interviewer: get this in terms of weeks, if possible.)

_____

Are there any time constraints which would preclude us from visiting with you and your faculty in the next 30 days? Are there days of the week that are better than others for us to visit with you?

_____

DENT. AUX. TELEPHONE INTERVIEW

PAGE 3

PROGRAM CODE _____

FTA SITE _____

ASSOCIATE DENTAL LABORATORY TECHNOLOGY

Will the instructors participating in the final period of the clinical aspects of the curriculum be available for interview? (YES) (NO)

Would you please give me the name of every individual on the associate dental laboratory technology faculty for the total period of the criterion class. If some of your associate faculty divide their time between or among two or more dental programs, name them in each program in which they participate.

FACULTY OR ADMINISTRATOR	SKILL CODE (CODE B)	PRIMARY ASSIGNMENT (CODE C)	GENERALLY, WHAT PROPORTIONATE AMOUNT OF TIME WAS THIS PERSON WORKING IN THIS ASSOCIATE DENTAL LABORATORY TECHNOLOGY PROGRAM?

Interviewer, use additional pages, if necessary.

SKILL CODE (CODE B)

01 General Dentistry
03 Dental Assistant
05 Dental Hygienist
11 Dental Laboratory Technician
20 Specialist in Dentistry (not used unless speciality unknown)
23 Periodontist
24 Prosthodontist
25 Orthodontist
26 Endodontist
27 Pedodontist
28 Oral Surgeon
30 Health Occupations Educator
31 Business Education
40 Registered Nurse
41 Licensed Practical Nurse
99 Other (specify)

PRIMARY ASSIGNMENT (CODE C)

1 Administrator
2 Lecturer
3 Laboratory Instructor
4 Clinical Instructor
5 Preceptor
6 Lect., Lab. & Clin. Inst.
7 Lecturer and Lab Inst.
8 Administrator and Lecturer
9 Admin., Lect., Lab & Clin. Inst.
0 Other (specify)

DENT. AUX. TELEPHONE INTERVIEW FORM

PAGE 4

PROGRAM CODE _____

FTA SITE _____

ASSOCIATE DENTAL LABORATORY TECHNOLOGY

How many associate dental laboratory technology classes have you graduated? _____ Classes

Do you have a catalog and a curriculum guide for the associate dental laboratory technology criterion class that you can mail to me? (YES)(NO)

PROGRAM CODE _____

FTA SITE _____

DENTAL AUXILIARY ON-SITE INTERVIEW FROM

ASSOCIATE DENTAL LABORATORY TECHNOLOGY

INDIVIDUAL FROM WHOM INFORMATION WAS OBTAINED _____

TITLE _____

TELEPHONE NO. _____

Who or what was it that stimulated the initial development of the associate dental laboratory technology program? _____

Probable code

1. Local dental association
2. State dental association
3. School personnel - general
4. School personnel - someone specific (skill area) _____
5. Other
6. Funding available

Do you have an active, formal advisory council(s) for this associate dental laboratory technology program? _____

Probable code

1. Yes, program specific
2. Yes, auxiliary specific
3. Yes, across auxiliaries
4. No

Do you keep formal minutes of advisory council(s) meetings? (YES) (NO)

How frequently has your advisory council(s) met in past 12 months? _____ (FREQUENCY)

DENT. AUX. ON-SITE INTERVIEW FORM

PAGE 2

PROGRAM CODE _____

FTA SITE _____

Indicate every type of clinical setting in which the students in the criterion class of associate dental laboratory technology have obtained clinical experience.

Probable code	
01	A general dentistry clinic or practices not in a dental or auxiliary school
02	A Periodontic clinic/office
03	A Prosthodontic clinic/office
04	An Orthodontic clinic/office
05	An Endodontic clinic/office
06	A Pedodontic clinic/office
07	An Oral surgery clinic/office
08	A general dentistry clinic in a dental school (not in an auxiliary school clinic)
09	A clinic within the teaching institution and considered unique to the auxiliary program(s)
10	A dental public health clinic/office
11	A dental prosthetics laboratory
12	Other (specify) _____

We would like to list the actual associate dental laboratory technology courses provided to the criterion class. Also, the name of every instructor having student contact with each specific course, the number of student contact hours each faculty member had with the students each week for the period he or she had direct contact with the students in the criterion class.

(INTERVIEWER: use Course-Faculty Information Forms.)

DENT. AUX. ON-SITE INTERVIEW FORM

PAGE 3

PROGRAM CODE _____

FTA SITE _____

COURSE-FACULTY INFORMATION FORM

COURSE NO. _____

COURSE TITLE _____

Number of weeks in the course _____ (weeks)

Describe course in terms of amount of time given to each of the following parts (report in hours/week)

Lecture hrs/wk	Lab hrs/wk	Clinical hrs/wk
_____	_____	_____

(NOTE: CONSIDER ALL INSTRUCTORS IN EVERY SECTION, IF MORE THAN ONE SECTION WAS OFFERED.)

INSTRUCTOR(S)	PROVIDER CODE	STUDENT CONTACT HOURS/WEEK LECTURE	LAB	CLINICAL	TOTAL
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____
_____	_____	_____	_____	_____	_____

APPENDIX C

TASK INVENTORY INSTRUMENT CODES

DENTAL AUXILIARIES EDUCATION STUDY
TASK INVENTORY INSTRUMENT CODES

CARD	COLUMN(S)	VARIABLE	CODE
01	1-2	CARD SEQUENCE A numeric sequence to provide an identification for each card punched for any one respondent.	01 through 20
01	3-5	FACULTY/ADMIN. NUMBER A unique numeric identification for each respondent.	Column 3. Primary Assignment of respondent in a specific auxiliary program (assignment related to the teaching of dental tasks): 1. Administrator 2. Lecturer 3. Laboratory Instructor 4. Clinical Instructor 5. Preceptor 6. Lect., Lab. & Clin. Inst. 7. Lecturer and Lab Inst. 8. Administrator and Lecturer 9. Admin., Lect., Lab & Clin. Inst. 0. Other (specify) Columns 4-5. Unique number given each respondent within a specific institution.
01	6-8	ASSIGNMENT CODE A code which identified the primary institutional setting of a specific auxiliary program; the specific auxiliary program for which respondent is replying and the type of completion awarded graduate of the program.	Column 6. Type of Institution in which Auxiliary Program is Located: 1. Dental School 2. Senior Institution other than a dental school 3. Community or Junior College 4. Military Program 5. Program not associated with any of above types (e.g., hospital, laboratory, etc.) Column 7. Specific Auxiliary Program: 1. Dental Assistant 2. Dental Hygiene 3. Dental Laboratory Technology 4. A Specific Expanded Functions Program Column 8. Type of Completion Award: 1. Certificate 2. Associate Degree 3. Baccalaureate Degree 4. Masters 5. Doctorate

CARD	COLUMN(S)	VARIABLE	CODE
01	9-11	SITE NUMBER A unique three-digit number given to each institution in which participating auxiliary programs are located.	001 and continuing
01	12-13	SKILL CODE Occupational Skill of respondent	01 General Dentistry 03 Dental Assistant 05 Dental Hygienist 11 Dental Laboratory Technician 20 Specialist in Dentistry (not used unless speciality unknown) 23 Periodontist 24 Prosthodontist 25 Orthodontist 26 Endodontist 27 Pedodontist 28 Oral Surgeon 30 Health Occupations Educator 31 Business Education 40 Registered Nurse 41 Licensed Practical Nurse 99 Other (specify)
01	14-15	PROJECT NUMBER University of Illinois FTA project number.	02
01	16-21	DATE DATA COLLECTED Use zero, if needed, to right-justify columns.	Columns 16-17. Month Columns 18-19. Day Columns 20-21. Year
01	22-27	BIRTHDATE Use zero, if needed, to right-justify columns.	Columns 22-23. Month Columns 24-25. Day Columns 26-27. Year
01	28	SEX	1. Male 2. Female
01	29	RACE	1. American Indian 2. Black/Negro 3. Oriental 4. Spanish Surname 5. White 6. Other
01	30	MARITAL STATUS	1. Never Married 2. Now Married 3. Other

CARD	COLUMN(S)	VARIABLE	CODE
01	31-33	CURRENT JOB TITLE Related to this specific auxiliary program.	Column 31. Use "Primary Assignment" number found in Column 3 of Card 01 Column 32. Use "Auxiliary Program" number found in Column 7 of Card 01 Column 33. Use "Completion Award" number found in Column 8 of Card 01
01	34-41	TIME ASSOCIATED WITH PROGRAM Use zero, if needed, to right-justify columns. "To present" or other such notations indicating "continuing in" are coded: month 0 6; year 7 3.	Columns 34-35. From Month Columns 36-37. From Year Columns 38-39. To Month Columns 40-41. To Year
01	42-49	TIME EMPLOYED IN THIS EDUC. INST. Use zero, if needed, to right-justify columns, "To present" or other such notations indicating "continuing in" are coded: month 0 6; year 7 3.	Columns 42-43. From Month Columns 44-45. From Year Columns 46-47. To Month Columns 48-49. To Year
01	50-52	LAST SALARIED HEALTH-RELATED JOB	Refer to 3-digit code used in Occupation Section of "1970 Census of Population: Alphabetical Index of Industries and Occupations"
01	53-60	TIME IN LAST HEALTH-RELATED JOB Use zero, if needed, to right-justify columns.	Columns 53-54. From Month Columns 55-56. From Year Columns 57-58. To Month Columns 59-60. To Year
01	61-63	LAST SALARIED NONHEALTH-RELATED JOB	Refer to 3-digit code used in Occupation Section of "1970 Census of Population: Alphabetical Index of Industries and Occupations"
01	64-71	TIME IN LAST NONHEALTH-RELATED JOB Use zero, if needed, to right-justify columns.	Columns 64-65. From Month Columns 66-67. From Year Columns 68-69. To Month Columns 70-71. To Year

CARD	COLUMN(S)	VARIABLE	CODE
02	1-8	CARD IDENTIFICATION Card sequence; Faculty-Admin. No.; Assignment No.	Columns 1-2. 02 Columns 3-8. Duplicate equivalent columns from previous card
02	9-10	HIGHEST LEVEL FORMAL ACADEMIC EDUCATION	01 Did not complete high school 02 Graduated from a high school program 03 Received high school diploma by GED exam 04 Freshman year of college or junior/community college 05 Sophomore year of college or junior/community college 06 Received an associate degree 07 Junior year of college 08 Received a bachelors degree 09 Attended graduate school but did not receive a degree 10 Received a masters degree 11 Did course work for doctorate but did not receive a degree 12 Received a doctoral degree (PhD, EdD, etc.) 13 Received a health profession doctorate (MD, DDS, etc.) 14 Attended post doctoral program
02	11-12	YEAR COMPLETED ACADEMIC PROGRAM	Date is entered as last two digits of year
02	13-14	MILITARY DIRECTED EDUCATION	01 None 02 Up to four months of technical or occupational preparation offered by one of the military services 03 More than four months and up to one year of technical or occupational preparation offered by one of the military services 04 Approximately two to three years of technical or occupational preparation offered by one of the military services

CARD	COLUMN(S)	VARIABLE	CODE
02	15-16	VOCATIONAL/TECHNICAL SCHOOL DIRECTED EDUCATION	05 None 06 Up to four months of technical or occupational preparation offered by a vocational or technical school 07 More than four months and up to one year of technical or occupational preparation offered by a vocational or technical school 08 Approximately two to three years of technical or occupational preparation offered by a vocational or technical school
02	17-18	HOSPITAL/HEALTH FACILITY DIRECTED EDUCATION	09 None 10 Up to four months of technical or occupational preparation offered by a hospital or health facility 11 More than four months and up to one year of technical or occupational preparation offered by a hospital or health facility 12 Approximately two to three years of technical or occupational preparation offered by a hospital or health facility
02	19-20	OTHER ORGANIZED/ DIRECTED TECHNICAL/ OCCUPATIONAL EDUCATION N.E.C.	13 None 14 Up to four months of organized short-term preparation plus on-the-job experience 15 At least one year of informal on-the-job experience 16 Participated in organized high school preparation program 17 Other
02	21-22	YEAR COMPLETED TECHNICAL OCCUPATIONAL EDUC.	Date is entered as last two digits of year
02	23-24	MAJOR AREA OF SPECIALIZATION IN HEALTH-RELATED EDUCATION	Use "Skill Code" (see Card 01, Columns 12-13)
02	25	TYPE OF DEGREE/ CERTIFICATE AWARDED	Use "Completion Award" (see Card 01, Column 8)

CARD	COLUMN(S)	VARIABLE	CODE
02	26	INSTITUTION IN WHICH HEALTH-RELATED EDUCATION OBTAINED	Use "Program Location" (see Card 01, Column 6)
02	27-28	YEAR COMPLETED HEALTH-RELATED EDUCATION	Date is entered as last two digits of year
02	29-31	STATE OR COUNTRY WHERE HEALTH-RELATED EDUCATION OBTAINED	State: 101 AL 115 IA 129 NH 143 TX 102 AK 116 KS 130 NJ 144 UT 103 AZ 117 KY 131 NM 145 VT 104 AR 118 LA 132 NY 146 VA 105 CA 119 ME 133 NC 147 WA 106 CO 120 MD 134 ND 148 WV 107 CT 121 MA 135 OH 149 WI 108 DE 122 MI 136 OK 150 WY 109 FL 123 MN 137 OR 151 D.C. 110 GA 124 MS 138 PA 111 HI 125 MO 139 RI 112 ID 126 MT 140 SC 113 IL 127 NE 141 SD 114 IN 128 NV 142 TN OR Country: A three digit code - 201 - 299
02	32-33	MAJOR AREA OF SPECIALIZATION IN HEALTH-RELATED EDUCATION	Use "Skill Code" (see Card 01, Columns 12-13)
02	34	TYPE OF DEGREE/ CERTIFICATE AWARDED	Use "Completion Award" (see Card 01, Column 8)
02	35	INSTITUTION IN WHICH HEALTH-RELATED EDUCATION OBTAINED	Use "Program Location" (see Card 01, Column 6)
02	36-37	YEAR COMPLETED HEALTH-RELATED EDUCATION	Date is entered as last two digits of year

CARD	COLUMN(S)	VARIABLE	CODE
02	38-40	STATE OR COUNTRY WHERE HEALTH-RELATED EDUCATION OBTAINED	Use "State Code" (see Card 02, Columns 29-31) OR Use "Country Code" (see Card 02, Columns 29-31)
02	41-43	CURRENT CERTIFICATIONS/ LICENSES/REGISTRIES IN HEALTH FIELD	Column 41. 1. Licensed 2. Certified 3. Registered Columns 42-43. Use "Skill Code" (see Card 01, Columns 12-13)
02	44-46	BY WHOM CERTIFIED/ LICENSED/REGISTERED STATES	Use "State Code" (see Card 02, Columns 29-31)
02	47-49	(continue)	OR
02	50-52	(continue)	Use "Country Code" (see Card 02, Columns 29-31) OR Association Code: 301 Board of Dental Public Health 302 Board of Endodontics 303 Board of Oral Pathology 304 Board of Oral Surgery 305 Board of Orthodontics 306 Board of Pedodontics 307 Board of Periodontics 308 Board of Prosthodontics 309 Certifying Board of the American Dental Assistants' Association 310 National Board for Certification in Dental Technology
02	53-55	SECOND CERTIFICATION/ LICENSE/REGISTRY IN HEALTH FIELD	Column 53. (see Card 02, Column 41) Columns 54-55. Use "Skill Code" (see Card 01, Columns 12-13)

CARD	COLUMN(S)	VARIABLE	CODE
02	56-58	BY WHOM LISC./ CERT./REG.	Use "State, Country, or Association Codes" State: Card 02, Columns 29-31 Country: Card 02, Columns 29-31 Association: Card 02, Columns 44-46
02	59-61	(continue)	
02	62-64	(continue)	
02	65-67	THIRD CERTIFICATION/ LICENSE/REGISTRY IN HEALTH FIELD	Column 65. (see Card 02, Column 41) Columns 66-67. Use "Skill Code" (see Card 01, Columns 12-13)
02	68-70	BY WHOM LISC./ CERT./REG.	Use "State, Country, or Association Codes" State: Card 02, Columns 29-31 Country: Card 02, Columns 29-31 Association: Card 02, Columns 44-46
02	71-73	(continue)	
02	74-76	(continue)	
03	1-80	NONE	Card not used but remaining cards are sequentially numbered as though it were used.
04-21	1-8	CARD IDENTIFICATION Card sequence; Faculty-Admin. No.; Assignment No.	Columns 1-2. 04 to 21 Columns 3-8. Duplicate equivalent of same columns of card 01.
04-20 & 21	9-80	624 TASK STATEMENTS (includes 61 duplicates)	Columns 9, 11, . . . 79. Responsibility level to which dental task is taught: 1. Not taught under my direction 2. Will be able to perform only under direct supervision 3. Will be able to perform with shared responsibility 4. Will be able to perform with independent responsibility Columns 10, 12, . . . 80. Cumulative time spent teaching each task: 1. Content relevant to this task not taught under my direction 2. One to 20 minutes of instruction 3. Over 20 minutes and up to 1 hour of instruction 4. Over 1 hour and up to 3 hours of instruction 5. Over 3 hours and up to 6 hours of instruction 6. Over 6 hours and up to 12 hours of instruction 7. Over 12 hours of instruction

APPENDIX D

DUPLICATE DENTAL TASK STATEMENTS

TABLE D-1

DUPLICATE DENTAL TASK STATEMENTS BY CATEGORY

CATEGORY TASK STATEMENTS	TASK ITEM NUMBER
1. Business and Office Management	
Transcribe/Type Dictaphone Tape	1002
Code Diagnosis/Service For Data Processing/Insurance	1006
Attend Course/Staff Meeting/Seminar	1017
Travel To/From Office/Clinic to Give Care	1023
Complete Report Form For Government Agency/Public Health/AMA, Etc.	1025
Present Case History at Staff Meeting	1029
Complete/Update Employees' Payroll Record	1032
Screen Visitor/Salesman to See Doctor	1035
Order/Purchase Office Supplies/Equipment	1040
Assist Patient to Complete Insurance Claim Form	1042
Prepare Collection Notice	1044
Write User Instruction For Equipment	1048
Record Telephone Message	1052
Organize/Revise a Filing System	1054
Write Instruction For Computer Data Processing	1055
2. Housekeeping — Clinical and General	
3. Patient Care: Records -- Dental, Medical	
Log X-ray Number/Identification Onto Record	1047
4. Patient Care: Examination--Including Diagnostic Tests & X-ray	
Examine External Lymph Nodes	1004
Conduct Reexamination/Orthodontic Recall	1014
Take X-ray of Sinus/Skull	1022
Perform Indirect Laryngoscopy, i.e., with Mirror	1030
Identify Extraoral Habits Affecting Occlusion	1046

TABLE D-1 Continued

DUPLICATE DENTAL TASK STATEMENTS BY CATEGORY

CATEGORY TASK STATEMENTS	TASK ITEM NUMBER
5. Patient Care: Analysis, Treatment Planning, and Consultation	
Plan/Adapt Diet for Patient (Not Order)	1005
Discuss Patient's Treatment with Prescriber	1016
Review Radiation Exposure Report	1020
Interpret Routine (Non-Contrast) X-ray	1033
Recommend Drug Therapy Based on Prescriber's Diagnosis	1037
Review Printed Patient Instructions on Examination/ Therapy Procedures with Patient/Family	1041
Consult and Review Patient's Medical/Dental Record	1057
6. Patient Care: Preventive and Patient Education	
Give Oral Habit Therapy	1308
7. Patient Care: Preparation	
Prepare Tooth For Cast Restoration, e.g., Full Crown, Jacket, Etc.	1021
Prepare Tooth For Drainage Via Root Canal	1355
8. Patient Care: Anesthesia and Medications	
Write Prescription For Prescriber's Signature	1012
Desensitize Hypersensitive Teeth	1038
9. Patient Care: Surgery and Surgically Related	
Perform Osseous Graft	1001
Perform Surgical Extraction, Full Bony Impaction	1007
Clean/Debride Wound/Cut (Not Abrasion or Burn)	1010
Establish/Maintain Airway by Using Endotracheal Tube	1013
Perform Direct Skeletal Fixation of Fracture	1019
Recover Tooth/Root From Antrum	1036
Control Bleeding by Ligation of Vessel	1051

TABLE D-1 Continued

DUPLICATE DENTAL TASK STATEMENTS BY CATEGORY

CATEGORY TASK STATEMENTS	TASK ITEM NUMBER
10. Patient Care: Impressions	
11. Patient Care: Dental Laboratory	
Construct Palatal Relief	1009
Sandblast Partial Denture Framework Casting	1034
Pour Cast From Preliminary Impression	1043
Flask/Pack/Cure/Deflask Denture or Partial Reline/ Repair/Duplicate	1050
Weld/Solder Orthodontic Band	1056
Soap Model	1148
12. Patient Care: Insertions and Restorations	
Install Removable Orthodontic Appliance	1003
Apply Varnish to Prepared Tooth	1008
Remove Temporary Crown/Jacket	1011
Place Wedge	1018
Adapt Matrix Band and Retainer to Teeth	1027
Try-in Partial Denture with Teeth Set in Wax	1031
Try-in Cast Restoration	1039
Try-in Partial Framework	1049
13. Patient Care: Adjustments and Repairs	
Adjust Partial Framework	1015
Adjust Provisional Dental Splint	1024
Repair Complete/Partial Denture (No Teeth Damaged)	1026
Adjust Fixed Orthodontic Appliance	1028
14. Patient Care: Chairside Assisting and Clinical Support	
Set Up Unit Bracket Table with Dental Instrument/Material	1045
Adapt Rubber Dam to One Tooth	1053

APPENDIX E

DENTAL TASK INVENTORY QUESTIONNAIRE RESPONSE RATE

TABLE E-1

NUMBER DENTAL TASK INVENTORY QUESTIONNAIRES DISTRIBUTED AND RETURNED FROM DENTAL ASSISTING EDUCATION PROGRAMS

PROGRAMS BY SITE	IDENTIFIED FACULTY/ PRECEPTORS	DISTRIBUTED N	DISTRIBUTED %	RETURNED* N	RETURNED* %
001					
Faculty	3	3	100	3	100
Preceptors	18	14	77.8	4	28.6
002					
Faculty	5	5	100	5	100
Preceptors	20	16	80.0	9	56.3
003					
Faculty	4	4	100	4	100
Preceptors	21	16	76.2	8	50
006					
Faculty	6	6	100	6	100
Preceptors	12	12	100	11	91.7
009					
Faculty	5	5	100	5	100
Preceptors	32	27	84.4	23	85.2
010					
Faculty	3	3	100	3	100
Preceptors	20	15	75.0	13	86.7
011					
Faculty	2	2	100	2	100
Preceptors	37	20	54.1	3	15.0
012					
Faculty	3	3	100	3	100
Preceptors	23	23	100	15	65.2
013					
Faculty	8	8	100	8	100
Preceptors	0				
014					
Faculty	10	10	100	10	100
Preceptors	31	21	67.7	19	90.5
TOTAL	263	213	81.0	154	72.3

*DTI questionnaires which were returned, complete or usable.

TABLE E-2

NUMBER DENTAL TASK INVENTORY QUESTIONNAIRES DISTRIBUTED

AND RETURNED FROM DENTAL HYGIENE EDUCATION PROGRAMS

PROGRAMS BY SITE	IDENTIFIED FACULTY/ PRECEPTORS	DISTRIBUTED N	DISTRIBUTED %	RETURNED* N	RETURNED* %
002					
Faculty	6	6	100	6	100
Preceptors	0				
005					
Faculty	6	6	100	5	83.3
Preceptors	0				
006					
Faculty	7	7	100	7	100
Preceptors	8	8	100	8	100
007					
Faculty	5	5	100	5	100
Preceptors	0				
008					
Faculty	5	5	100	5	100
Preceptors	6	0	0.0		
014					
Faculty	15	15	100	12	80.0
Preceptors	0				
015					
Faculty	11	11	100	10	90.9
Preceptors	0				
TOTAL	69	63	91.3	58	92.1

*DTI questionnaires which were returned, complete or usable.

TABLE E-3

NUMBER DENTAL TASK INVENTORY QUESTIONNAIRES DISTRIBUTED

AND RETURNED FROM DENTAL LABORATORY TECHNICIAN EDUCATION PROGRAMS

PROGRAMS BY SITE	IDENTIFIED FACULTY/ PRECEPTORS	DISTRIBUTED N	DISTRIBUTED %	RETURNED* N	RETURNED* %
001					
Faculty	3	3	100	3	100
Preceptors	0				
005					
Faculty	5	5	100	5	100
Preceptors	0				
TOTAL	8	8	100	8	100

*DTI questionnaires which were returned, complete or usable.

TABLE E-4

COMPLETION RATE OF DENTAL TASK INVENTORY BY

PROGRAM SITE AND BY FACULTY AND PRECEPTOR RESPONDENTS

PROGRAM SITE	FACULTY N	COMPLETION %*	PRECEPTORS N	COMPLETION %
Dental Assisting				
001	3	99.6	4	99.7
002	5	99.8	9	95.7
003	4	99.4	8	96.9
006	6	99.7	10	99.4
009	5	99.7	23	99.5
010	3	99.6	13	95.1
011	2	99.5	3	99.8
012	3	98.5	16	98.4
013	8	99.8	0	
014	10	99.9	19	98.9
Dental Hygiene				
002	6	99.8	0	
005	5	99.9	0	
006	7	99.4	8	99.9
007	5	99.7	0	
008	5	99.9	0	
014	12	99.5	0	
015	10	99.6	0	
Dental Laboratory Technician				
001	3	98.5	0	
005	5	99.8	0	
All Auxiliaries	107	99.6	113	98.3

*Mean percent of dental task statement item responded to in DTI questionnaire, except time scales.

APPENDIX F

RESPONSIBILITY RESPONSES TO 563 DENTAL TASK STATEMENTS BY FACULTIES OF THREE DENTAL AUXILIARIES

Introduction To Table F-1

In Table F-1, the 563 dental task statements contained in the Dental Task Inventory are identified. The statements are presented in fourteen categories which relate the tasks to related types of dental procedures and functions.

Following each task statement is the percent of total Faculty responses to each of the response scale options provided in the DTI questionnaire: (1) not taught under my direction, (2) student will be able to perform, but only under direct supervision, (3) student will be able to perform with shared responsibility, and (4) student will be able to perform with independent responsibility. A fifth response identity is also noted for those respondents who did not respond (NR) to the task statement. The response levels were grouped to reflect "NR-1" (those tasks which were most likely not taught), "2" (those tasks which required the immediate and direct supervision of the dentist, or some supervisor, while they are being performed by the respective auxiliary, and "3-4" (those tasks which may be performed at a level of responsibility which would allow or permit the dentist, or some supervisor, to engage in other dental procedures while the task indicated is being performed by the auxiliary).

Those tasks marked by an asterisk (*) are those 65 tasks statements for which there was not exact responsibility level agreement between the dental assisting and the dental hygiene "all programs" profiles; i.e., if a student were to enroll in every dental assisting program and in every dental hygiene program, these 65 statements would represent the total differences between the task content of the two dental auxiliaries as measured by this inventory.

TABLE F-1

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 1 BUSINESS AND OFFICE MANAGEMENT	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Screen and process patient on arrival for appropriate disposition including triage	87.8	0.0	12.2	88.0	0.0	12.0	100.0	0.0	0.0
Prepare record/register for incoming patient	65.3	0.0	34.7	64.0	2.0	34.0	100.0	0.0	0.0
Issue/collect film badge or other radiation detector	71.4	2.0	26.5	82.0	0.0	18.0	100.0	0.0	0.0
Review and approve report/record from staff	89.8	0.0	10.2	90.0	2.0	8.0	100.0	0.0	0.0
Coordinate patient treatment plan with other departments/agencies/specialists	71.4	8.2	20.4	68.0	10.0	22.0	100.0	0.0	0.0
File prescription	75.5	2.0	22.4	90.0	0.0	10.0	75.0	0.0	25.0
Post and maintain special files for narcotics and other controlled items (not narcotics count)	81.6	6.1	12.2	92.0	2.0	6.0	100.0	0.0	0.0
Update inventory of druges other than narcotics/controlled drugs	73.5	4.1	22.4	86.0	4.0	10.0	100.0	0.0	0.0
Babysit for child or patient's child	83.7	2.0	14.3	80.0	0.0	20.0	100.0	0.0	0.0
Translate for staff member or patient with language/sensory problem	93.9	0.0	6.1	86.0	2.0	12.0	100.0	0.0	0.0
Explain fees/charges to patient	71.4	2.0	26.5	70.0	2.0	28.0	100.0	0.0	0.0
Explain insurance coverage to patient/family	77.6	0.0	22.4	92.0	0.0	8.0	100.0	0.0	0.0
Obtain legal waiver from patient	81.6	0.0	18.4	84.0	2.0	14.0	100.0	0.0	0.0
Plan and schedule work assignments/vacations	81.6	4.1	14.3	86.0	0.0	14.0	87.5	12.5	0.0
Complete administrative form, e.g. incident, accident, safety report	81.6	2.0	16.3	88.0	4.0	8.0	100.0	0.0	0.0
Schedule ancillary (lab, x-ray) patient services	77.6	0.0	22.4	80.0	0.0	20.0	87.5	12.5	0.0
Plan/update local administrative operating procedure/ regulations	87.8	2.0	10.2	92.0	0.0	8.0	87.5	0.0	12.5
Prepare a budget for future income and expenses	87.8	2.0	10.2	92.0	0.0	8.0	62.5	12.5	25.0
Write correspondence/report/summary (not forms)	73.5	0.0	26.5	72.0	2.0	26.0	100.0	0.0	0.0
Complete report form for government agency/public health/AMA, etc.	75.5	0.0	24.5	84.0	4.0	12.0	100.0	0.0	0.0
Update publications reference file	77.6	4.1	18.4	90.0	2.0	8.0	75.0	12.5	12.5
Explain consent form/obtain patient's signature/sign as witness to signature	69.4	6.1	24.5	62.0	4.0	34.0	87.5	0.0	12.5
Write user instruction for equipment	79.6	2.0	18.4	88.0	0.0	12.0	75.0	12.5	12.5
Explain administrative procedure/form (other than insurance) to patient/family	73.5	4.1	22.4	80.0	2.0	18.0	100.0	0.0	0.0
Interview/counsel staff (job performance/personal problem/education/complaints)	83.7	4.1	12.2	82.0	2.0	16.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 1 BUSINESS AND OFFICE MANAGEMENT	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Interview/evaluate/hire prospective personnel	87.8	8.2	4.1	86.0	4.0	10.0	100.0	0.0	0.0
Orient new employee	71.4	2.0	26.5	80.0	2.0	18.0	75.0	0.0	25.0
Review and approve staff payroll (time and salary)	79.6	4.1	16.3	94.0	0.0	6.0	100.0	0.0	0.0
Instruct staff in operation of equipment	63.3	4.1	32.7	74.0	0.0	26.0	62.5	0.0	37.5
Conduct meeting/class/seminar	81.6	4.0	16.3	76.0	0.0	24.0	62.5	12.5	25.0
Attend course/staff meeting/seminar	61.2	0.0	38.8	64.0	0.0	36.0	87.5	0.0	12.5
Read/review professional literature	61.2	0.0	38.8	54.0	0.0	46.0	50.0	0.0	50.0
Operate audiovisual equipment, e.g. projector, recorder, etc	83.7	0.0	16.3	76.0	4.0	20.0	62.5	0.0	37.5
Locate misplaced chart/health record	67.3	0.0	32.7	62.0	2.0	36.0	100.0	0.0	0.0
Pull or file patient's medical/dental record	67.3	0.0	32.7	52.0	0.0	48.0	100.0	0.0	0.0
File items into individual patient record	65.3	0.0	34.7	64.0	2.0	34.0	100.0	0.0	0.0
Receive/issue/distribute supplies/equipment/laundry	65.3	0.0	34.7	56.0	2.0	42.0	50.0	0.0	50.0
Direct storage/issue/safeguarding of security items	67.3	4.1	28.6	84.0	2.0	14.0	75.0	12.5	12.5
Schedule/verify patient appointment	67.3	0.0	32.7	52.0	0.0	48.0	100.0	0.0	0.0
Take dictation (not doctor's orders)	95.9	0.0	4.1	96.0	0.0	4.0	100.0	0.0	0.0
*Transcribe/type dictaphone tape	93.9	0.0	6.1	100.0	0.0	0.0	100.0	0.0	0.0
Type correspondence/report from rought draft	77.6	0.0	22.4	92.0	0.0	8.0	87.5	0.0	12.5
Operate copy machine, e.g. xerox	87.8	0.0	12.2	92.0	0.0	8.0	100.0	0.0	0.0
Operate business machine (not typewriter/copy machine)	89.8	2.0	8.2	96.0	0.0	4.0	100.0	0.0	0.0
Write instruction for computer data processing	95.9	0.0	4.1	96.0	0.0	4.0	100.0	0.0	0.0
Code diagnosis/service for data processing/insurance	87.8	0.0	12.2	96.0	0.0	4.0	100.0	0.0	0.0
Perform outside administrative errand, e.g. pick-up/mail	65.3	0.0	34.7	76.0	2.0	22.0	87.5	0.0	12.5
Record telephone message	71.4	0.0	28.6	72.0	0.0	28.0	100.0	0.0	0.0
Place telephone call for another person	63.3	0.0	36.7	76.0	0.0	24.0	87.5	0.0	12.5
Screen visitor/salesman to see doctor	61.2	2.0	36.7	82.0	0.0	18.0	100.0	0.0	0.0
Sort/screen/distribute	75.5	0.0	24.5	88.0	0.0	12.0	100.0	0.0	0.0
Compile/update mailing list	77.6	0.0	22.4	86.0	2.0	12.0	100.0	0.0	0.0
Proofread correspondence/publication	81.6	2.0	16.3	90.0	0.0	10.0	87.5	0.0	12.5
Place material in files other than medical/dental records	81.6	0.0	18.4	80.0	0.0	20.0	100.0	0.0	0.0
Organize/revise a filing system	75.5	2.0	22.4	80.0	2.0	18.0	87.5	0.0	12.5
Prepare certificate/affidavit for third party	95.9	2.0	2.0	92.0	2.0	6.0	100.0	0.0	0.0
Complete form for filing patient's insurance	71.4	0.0	28.6	88.0	2.0	10.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 1 BUSINESS AND OFFICE MANAGEMENT	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Follow up unpaid/lost/rejected insurance claim	81.6	2.0	16.3	94.0	0.0	6.0	100.0	0.0	0.0
Prepare charge slip for service to patient	71.4	0.0	28.6	72.0	0.0	28.0	100.0	0.0	0.0
Prepare statement for patient billing either for patient or billing service	71.4	2.0	26.5	90.0	0.0	10.0	87.5	0.0	12.5
Receive payment from patient or representative and make entry to record	67.3	0.0	32.7	68.0	0.0	32.0	100.0	0.0	0.0
Extract billing data from doctor's notes/patient file	73.5	0.0	26.5	88.0	0.0	12.0	100.0	0.0	0.0
Complete form to assign account to collection agent	77.6	0.0	22.4	94.0	2.0	4.0	100.0	0.0	0.0
Review and evaluate collection agent's status report	81.6	4.1	14.3	94.0	0.0	6.0	100.0	0.0	0.0
Assist patient to complete insurance claim form	73.5	0.0	26.5	92.0	0.0	8.0	100.0	0.0	0.0
Order/purchase office supplies/equipment	67.3	0.0	32.7	82.0	0.0	18.0	75.0	12.5	12.5
Order/purchase medical/dental supplies/equipment	65.3	4.1	30.6	76.0	0.0	24.0	50.0	12.5	37.5
Issue receipt	61.2	0.0	38.8	70.0	2.0	28.0	75.0	0.0	25.0
Update a file of paid and unpaid invoices	73.5	0.0	26.5	88.0	4.0	8.0	87.5	0.0	12.5
Verify/approve invoice for payment	77.6	0.0	22.4	92.0	0.0	8.0	87.5	0.0	12.5
Prepare invoice/voucher for payment of funds	77.6	0.0	22.4	90.0	2.0	8.0	87.5	0.0	12.5
Balance books	77.6	2.0	20.4	88.0	2.0	10.0	100.0	0.0	0.0
Prepare check for signature	67.3	0.0	32.7	88.0	0.0	12.0	100.0	0.0	0.0
Complete/update employees' payroll record	77.6	4.1	18.4	96.0	0.0	4.0	87.5	12.5	0.0
Complete forms for employees' taxes (income and fica)	79.6	0.0	20.4	94.0	2.0	4.0	100.0	0.0	0.0
Analyze financial report accounting procedure	89.8	2.0	8.2	96.0	0.0	4.0	87.5	12.5	0.0
Prepare bank deposit	69.4	2.0	28.6	90.0	0.0	10.00	100.0	0.0	0.0
Update financial transactions in general journal	79.6	0.0	20.4	92.0	0.0	8.0	100.0	0.0	0.0
Update record of nonpractice income and expenses	87.8	2.0	10.2	94.0	0.0	6.0	100.0	0.0	0.0
Prepare work order/work request	67.3	0.0	32.7	90.0	0.0	10.0	62.5	0.0	37.5
Prepare collection notice	73.5	4.1	22.4	94.0	0.0	6.0	100.0	0.0	0.0
Distribute patient/professional literature	59.2	0.0	40.8	38.0	0.0	62.0	100.0	0.0	0.0
Update inventory of precious metals	77.6	2.0	20.4	90.0	2.0	8.0	25.0	0.0	75.0
Plan inventory system for supplies and equipment	67.3	2.0	30.6	78.0	2.0	20.0	75.0	12.5	12.5
Reproduce x-ray film on 35 mm slide	91.8	0.0	8.2	94.0	2.0	4.0	100.0	0.0	0.0
Identify film on x-ray film identifier	61.2	0.0	38.8	62.0	0.0	38.0	100.0	0.0	0.0
Prepare and file x-ray file envelope	57.1	0.0	42.9	64.0	0.0	36.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 2 HOUSEKEEPING: CLINICAL AND GENERAL	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Break down instruments for post operative cleaning	57.1	0.0	42.9	62.0	0.0	38.0	100.0	0.0	0.0
Sterilize materials (autoclave, gas, solution, sonic, etc.)	51.0	0.0	49.0	36.0	2.0	62.0	87.5	0.0	12.5
Prepare items for sterilization	57.1	0.0	42.9	42.0	0.0	58.0	100 0	0.0	0.0
Check and maintain instruments for working condition	53.1	0.0	46.9	40.0	0.0	60.0	75.0	0.0	25.0
Refill solution container	69.4	0.0	30.6	66.0	0.0	34.0	100.0	0.0	0.0
Inspect all areas and rooms for cleanliness/temperature/ adequate supplies/safety	55.1	0.0	44.9	54.0	0.0	46.0	62.5	12.5	25.0
Plan/arrange for routine equipment maintenance	55.1	2.0	42.9	68.0	2.0	30.0	62.5	0.0	37.5
Clean equipment	46.9	0.0	53.1	36.0	2.0	62.0	25.0	12.5	62.5
Wash/clean nontreatment area	63.3	0.0	36.7	74.0	0.0	26.0	100.0	0.0	0.0
Store supplies/equipment/laundry	61.2	0.0	38.8	70.0	0.0	30.0	62.5	0.0	37.5
Wash/clean glassware/instruments	51.0	0.0	49.0	50.0	0.0	50.0	87.5	0.0	12.5
Maintain dental laboratory/operatory equipment	49.0	2 0	49.0	68.0	0.0	32.0	12.5	12.5	75.0
Do minor repair/adjustment on equipment	67.3	2.0	30.6	68.0	4.0	28.0	25.0	0.0	75.0
Clean dental operatory after conclusion of procedures	55.1	0.0	44.9	34.0	2.0	64.0	100.0	0.0	0.0
Clean x-ray processing equipment	53.1	0.0	46.9	62.0	0.0	38.0	100.0	0.0	0.0
Clean cassettes/other x-ray film holders	63.3	0.0	36.7	74.0	0.0	26.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 3 PATIENT CARE: RECORDS--DENTAL, MEDICAL	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Obtain patient's chief complaint/present problem	53.1	2.0	44.9	28.0	6.0	66.0	100.0	0.0	0.0
Obtain history of present illness/problems	53.1	6.1	40.8	30.0	2.0	68.0	100.0	0.0	0.0
Obtain past medical/dental history	55.1	2.0	42.9	28.0	0.0	72.0	100.0	0.0	0.0
Obtain history of family illnesses	55.1	4.1	40.8	42.0	0.0	58.0	100.0	0.0	0.0
Obtain patient's psychosocial history, e.g. alcohol, sex, family situation, etc.	67.3	2.0	30.6	48.0	2.0	50.0	100.0	0.0	0.0
Obtain patient's history of medication use	57.1	6.1	36.7	28.0	0.0	72.0	100.0	0.0	0.0
Record progress/therapy note on patient record	55.1	4.1	40.8	42.0	2.0	56.0	100.0	0.0	0.0
Make up chart for new patient	63.3	0.0	36.7	34.0	0.0	66.0	100.0	0.0	0.0
Record oral conditions as directed by dentist	51.0	0.0	49.0	38.0	2.0	60.0	87.5	12.5	0.0
Perform dental charting	51.0	0.0	49.0	24.0	4.0	72.0	87.5	0.0	12.5
Record results of periodontal examination	61.2	2.0	36.7	32.0	2.0	66.0	100.0	0.0	0.0
Log x-ray number/identification on to record	63.3	0.0	36.7	70.0	0.0	30.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 4 PATIENT CARE: EXAMINATIONS--INCLUDING DIAGNOSTIC TESTS AND X-RAY	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Examine skin	91.8	0.0	8.2	60.0	4.0	36.0	100.0	0.0	0.0
*Examine head by inspection/palpation (not neurological exam)	91.8	8.2	0.0	50.0	8.0	42.0	100.0	0.0	0.0
Observe and report symptoms of acute physical distress	61.2	4.1	34.7	44.0	10.0	46.0	100.0	0.0	0.0
*Examine sinuses, e.g. pressure, transillumination	98.0	2.0	0.0	96.0	0.0	4.0	100.0	0.0	0.0
Examine throat, mouth, and pharynx	87.8	8.2	4.1	38.0	4.0	58.0	100.0	0.0	0.0
*Perform indirect laryngoscopy, i.e. with mirror	93.9	6.1	0.0	92.0	2.0	6.0	100.0	0.0	0.0
Examine external lymph nodes	83.7	10.2	6.1	44.0	4.0	52.0	100.0	0.0	0.0
Examine peripheral pulses and veins	85.7	6.1	8.2	84.0	6.0	10.2	100.0	0.0	0.0
*Examine muscles for strength, size, tone, tenderness	89.8	10.2	0.0	86.0	6.0	8.0	100.0	0.0	0.0
Obtain blood specimen by venipuncture	95.9	0.0	4.1	94.0	2.0	4.0	100.0	0.0	0.0
Obtain blood specimen by skin puncture (finger, ear, heel, etc.)	91.8	2.0	6.1	88.0	2.0	10.0	100.0	0.0	0.0
Take skin/mucosal scrape specimen from patient	89.8	6.1	4.1	60.0	2.0	38.0	100.0	0.0	0.0
Perform skin test, e.g. TB, histo, etc.	98.0	0.0	2.0	96.0	0.0	4.0	100.0	0.0	0.0
Take x-ray of sinus/skull	73.5	6.1	20.4	80.0	4.0	16.0	100.0	0.0	0.0
Take x-ray of mandible	65.3	2.0	32.7	58.0	4.0	38.0	100.0	0.0	0.0
Take x-ray of TM joint	79.6	2.0	18.4	90.0	4.0	6.0	100.0	0.0	0.0
Select/arrange x-rays for viewing	49.0	0.0	51.0	48.0	0.0	52.0	100.0	0.0	0.0
Prepare requisition for diagnostic procedures, e.g. lab	77.6	8.2	14.3	82.0	2.0	16.0	100.0	0.0	0.0
Receive and preserve biopsy specimen	87.8	2.0	10.2	92.0	2.0	6.0	100.0	0.0	0.0
Identify extra-oral habits affecting occlusion	87.8	8.2	4.1	46.0	8.0	46.0	87.5	0.0	12.5
Take/prepare oral cytologic smear	85.7	6.1	8.2	66.0	0.0	34.0	100.0	0.0	0.0
Palpate parotid/submaxillary/sublingual gland	85.7	10.2	4.1	52.0	2.0	46.0	100.0	0.0	0.0
Perform intraoral dental examination on child	83.7	5.1	10.2	32.0	8.0	60.0	100.0	0.0	0.0
Perform intraoral dental examination on adult	75.5	6.1	18.4	36.0	4.0	60.0	100.0	0.0	0.0
Perform periodontal examination	87.8	6.1	6.1	32.0	2.0	66.0	100.0	0.0	0.0
Examine teeth for plaque index	65.3	8.2	26.5	34.0	0.0	66.0	87.5	0.0	12.5
Examine mouth for periodontal index	87.8	0.0	12.2	32.0	2.0	66.0	100.0	0.0	0.0
Perform carie susceptibility test, e.g. Snyder test	79.6	0.0	20.4	48.0	2.0	50.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 4 PATIENT CARE: EXAMINATIONS--INCLUDING DIAGNOSTIC TESTS AND X-RAY	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Perform vitamin C test	95.9	0.0	4.1	84.0	2.0	14.0	100.0	0.0	0.0
Make preliminary oral examination for orthodontic	83.7	12.2	4.1	70.0	6.0	24.0	100.0	0.0	0.0
Conduct reexamination, retention supervision	93.9	2.0	4.1	88.0	0.0	12.0	87.5	0.0	12.5
Conduct reexamination/orthodontic recall	89.8	4.1	6.1	92.0	0.0	8.0	100.0	0.0	0.0
Make tracing from lateral headplate	93.9	2.0	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Position patient for dental x-ray	53.1	0.0	46.9	52.0	0.0	48.0	100.0	0.0	0.0
Take bite wing x-ray	55.1	0.0	44.9	48.0	0.0	52.0	100.0	0.0	0.0
Take full mouth x-ray	53.1	0.0	46.9	48.0	0.0	52.0	100.0	0.0	0.0
Take periapical x-ray	53.1	0.0	46.9	50.0	0.0	50.0	100.0	0.0	0.0
Take occlusal x-ray	67.3	2.0	30.6	64.0	2.0	34.0	100.0	0.0	0.0
Take panoramic x-ray	79.6	6.1	14.3	84.0	4.0	12.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND PROGRAM

CATEGORY 5 PATIENT CARE: ANALYSIS, TREATMENT PLANNING, AND CONSULTATION	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Interpret routine (non-contrast) x-ray	75.5	8.2	16.3	66.0	4.0	30.0	100.0	0.0	0.0
Confer with nonmedical personnel (teacher, employer) on patient's condition	85.7	2.0	12.2	64.0	0.0	36.0	87.5	0.0	12.5
Review radiation exposure report	73.5	6.1	20.4	78.0	8.0	14.0	100.0	0.0	0.0
Prepare/revise standing medical/dental order/policy	79.6	4.1	16.3	86.0	2.0	12.0	87.5	0.0	12.5
Present case history at staff meeting	85.7	4.1	10.2	78.0	2.0	20.0	100.0	0.0	0.0
Develop treatment plan (medical, surgical, OT, PT, psychological, drug, dental, etc.)	83.7	10.2	6.1	64.0	8.0	28.0	100.0	0.0	0.0
Consult and review patient's medical/dental record	65.3	2.0	32.7	30.0	2.0	68.0	100.0	0.0	0.0
Discuss patient's treatment with prescriber	79.6	4.1	16.3	70.0	4.0	26.0	100.0	0.0	0.0
Read skin test	98.0	0.0	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Write/dictate medical/dental report/correspondence, e.g. physical exam, history, finding	69.4	2.0	28.6	66.0	0.0	34.0	87.5	0.0	12.5
Recommend drug therapy based on prescriber's diagnosis	93.9	2.0	4.1	86.0	8.0	6.0	100.0	0.0	0.0
Plan/adapt diet for patient (not order)	73.5	6.1	20.4	42.0	4.0	54.0	100.0	0.0	0.0
Answer patient inquiry regarding nonprescription drugs	79.6	6.1	14.3	66.0	4.0	30.0	100.0	0.0	0.0
Ascertain family's understanding and acceptance of illness/ treatment	65.3	2.0	32.7	56.0	0.0	44.0	100.0	0.0	0.0
Review/answer patient complaint concerning service	65.3	2.0	32.7	66.0	6.0	28.0	100.0	0.0	0.0
Provide care in patient's home/nursing home independently	95.9	0.0	4.1	64.0	2.0	34.0	100.0	0.0	0.0
Travel to/from office/clinic to give care	87.8	2.0	10.2	70.0	0.0	30.0	100.0	0.0	0.0
Use and evaluate new equipment/material (user-trial)	63.3	4.1	32.7	50.0	6.0	44.0	50.0	25.0	25.0
Inspect dental case/model for acceptance	71.4	4.1	24.5	84.0	2.0	14.0	25.0	12.5	62.5
Design removable partial denture	93.9	6.1	0.0	98.0	2.0	0.0	25.0	0.0	75.0
Survey cast for partial denture design	93.9	4.1	2.0	96.0	2.0	2.0	62.5	0.0	37.5
Check orthodontic appliance for conformity to specifications	87.8	6.1	6.1	94.0	2.0	4.0	75.0	12.5	12.5
*Consult with physician/surgeon on constructing dental appliance	93.9	6.1	0.0	92.0	4.0	4.0	62.5	0.0	37.5
Determine arch length from x-ray	83.7	6.1	10.2	90.0	2.0	8.0	100.0	0.0	0.0
Determine tooth space requirements from x-ray	93.9	2.0	4.1	90.0	0.0	10.0	100.0	0.0	0.0
Analyze cephalometric tracing, Downs/Reidel analysis	93.9	2.0	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Make diagnosis, prepare treatment plan	91.8	6.1	2.0	68.0	8.0	24.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND PROGRAM

CATEGORY 5 PATIENT CARE: ANALYSIS, TREATMENT PLANNING, AND CONSULTATION	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Interpret routine (non-contrast) x-ray	75.5	8.2	16.3	66.0	4.0	30.0	100.0	0.0	0.0
Confer with nonmedical personnel (teacher, employer) on patient's condition	85.7	2.0	12.2	64.0	0.0	36.0	87.5	0.0	12.5
Review radiation exposure report	73.5	6.1	20.4	78.0	8.0	14.0	100.0	0.0	0.0
Prepare/revise standing medical/dental order/policy	79.6	4.1	16.3	86.0	2.0	12.0	87.5	0.0	12.5
Present case history at staff meeting	85.7	4.1	10.2	78.0	2.0	20.0	100.0	0.0	0.0
Develop treatment plan (medical, surgical, OT, PT, psychological, drug, dental, etc.)	83.7	10.2	6.1	64.0	8.0	28.0	100.0	0.0	0.0
Consult and review patient's medical/dental record	65.3	2.0	32.7	30.0	2.0	68.0	100.0	0.0	0.0
Discuss patient's treatment with prescriber	79.6	4.1	16.3	70.0	4.0	26.0	100.0	0.0	0.0
Read skin test	98.0	0.0	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Write/dictate medical/dental report/correspondence, e.g. physical exam, history, finding	69.4	2.0	28.6	66.0	0.0	34.0	87.5	0.0	12.5
Recommend drug therapy based on prescriber's diagnosis	93.9	2.0	4.1	86.0	8.0	6.0	100.0	0.0	0.0
Plan/adapt diet for patient (not order)	73.5	6.1	20.4	42.0	4.0	54.0	100.0	0.0	0.0
Answer patient inquiry regarding nonprescription drugs	79.6	6.1	14.3	66.0	4.0	30.0	100.0	0.0	0.0
Ascertain family's understanding and acceptance of illness/ treatment	65.3	2.0	32.7	56.0	0.0	44.0	100.0	0.0	0.0
Review/answer patient complaint concerning service	65.3	2.0	32.7	66.0	6.0	28.0	100.0	0.0	0.0
Provide care in patient's home/nursing home independently	95.9	0.0	4.1	64.0	2.0	34.0	100.0	0.0	0.0
Travel to/from office/clinic to give care	87.8	2.0	10.2	70.0	0.0	30.0	100.0	0.0	0.0
Use and evaluate new equipment/material (user-trial)	63.3	4.1	32.7	50.0	6.0	44.0	50.0	25.0	25.0
Inspect dental case/model for acceptance	71.4	4.1	24.5	84.0	2.0	14.0	25.0	12.5	62.5
Design removable partial denture	93.9	6.1	0.0	98.0	2.0	0.0	25.0	0.0	75.0
Survey cast for partial denture design	93.9	4.1	2.0	96.0	2.0	2.0	62.5	0.0	37.5
Check orthodontic appliance for conformity to specifications	87.8	6.1	6.1	94.0	2.0	4.0	75.0	12.5	12.5
*Consult with physician/surgeon on constructing dental appliance	93.9	6.1	0.0	92.0	4.0	4.0	62.5	0.0	37.5
Determine arch length from x-ray	83.7	6.1	10.2	90.0	2.0	8.0	100.0	0.0	0.0
Determine tooth space requirements from x-ray	93.9	2.0	4.1	90.0	0.0	10.0	100.0	0.0	0.0
Analyze cephalometric tracing, Bowns/Reidel analysis	93.9	2.0	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Make diagnosis, prepare treatment plan	91.8	6.1	2.0	68.0	8.0	24.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 6 PATIENT CARE: PREVENTIVE AND PATIENT EDUCATION	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Perform oral prophylaxis	85.7	10.2	4.1	28.0	0.0	72.0	100.0	0.0	0.0
Review printed patient instructions on examination/therapy/ procedures with patient/family	67.3	6.1	26.5	50.0	2.0	48.0	87.5	0.0	12.5
Recommend/give patient/family supplementary health education pamphlets or books	51.0	2.0	46.9	30.0	0.0	70.0	100.0	0.0	0.0
Present/explain diet analysis form to patient	61.2	6.1	32.7	50.0	4.0	46.0	100.0	0.0	0.0
Instruct patient in oral hygiene	44.9	6.1	49.0	24.0	0.0	76.0	100.0	0.0	0.0
Remove plaque/stain/polish teeth	75.5	10.2	14.3	28.0	0.0	72.0	100.0	0.0	0.0
Clean interproximal surfaces of teeth with dental floss or tape	55.1	2.0	42.9	26.0	0.0	74.0	100.0	0.0	0.0
Apply disclosing solution to the teeth to identify bacterial plaque	59.2	4.1	36.7	24.0	2.0	74.0	100.0	0.0	0.0
Remove subgingival calculus	93.9	4.1	2.0	30.0	2.0	68.0	100.0	0.0	0.0
Remove supragingival calculus	93.9	4.1	2.0	30.0	2.0	68.0	100.0	0.0	0.0
Give oral habit therapy	79.6	4.1	16.3	62.0	6.0	32.0	100.0	0.0	0.0
Give or help patient with oral hygiene, e.g. brush teeth, clean dentures, mouthwash	49.0	6.1	44.9	26.0	0.0	74.0	100.0	0.0	0.0
Teach patient self-care preventive dentistry measures, e.g. use of toothbrush, water pic	53.1	2.0	44.9	24.0	0.0	76.0	100.0	0.0	0.0
Apply fluoride to teeth by isolation with cotton rolls	75.5	4.1	20.4	32.0	2.0	66.0	100.0	0.0	0.0
Give physiotherapy instruction for TMJ difficulty	91.8	6.1	2.0	88.0	4.0	8.0	100.0	0.0	0.0
Apply fluoride gel to teeth using tray technique	81.6	4.1	14.3	30.0	0.0	70.0	100.0	0.0	0.0
Apply fluoride to teeth using ionizing device	85.7	8.2	6.1	74.0	2.0	24.0	100.0	0.0	0.0
Use ultrasonic device to remove calculus	87.8	6.1	6.1	34.0	0.0	66.0	87.5	0.0	12.5
Examine brushing effectiveness; indicate deficient areas to patient	55.1	2.0	42.9	24.0	2.0	74.0	100.0	0.0	0.0
Demonstrate proper brushing technique to patient	49.0	6.1	44.9	24.0	0.0	76.0	100.0	0.0	0.0
Demonstrate flossing technique to patient	51.0	4.1	44.9	24.0	0.0	76.0	100.0	0.0	0.0
Provide patient with dental health education materials	53.1	2.0	44.9	28.0	0.0	72.0	100.0	0.0	0.0
Explaine etiology of caries and periodontal disease	53.1	6.1	40.8	26.0	2.0	72.0	87.5	12.5	0.0
Give instructions to patient on bridge care	61.2	2.0	36.7	42.0	0.0	58.0	87.5	0.0	12.5
Educate patient in periodontic care	61.2	4.1	34.7	26.0	2.0	72.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 7 PATIENT CARE: PREPARATIONS	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Prepare tooth for drainage via root canal	91.8	8.2	0.0	98.0	2.0	0.0	100.0	0.0	0.0
*Excavate dental carie using conventional handpiece	89.8	8.2	2.0	96.0	4.0	0.0	100.0	0.0	0.0
*Excavate dental carie using high-speed handpiece	89.8	10.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Prepare rest/reshape teeth for partial denture	91.8	8.2	0.0	96.0	4.0	0.0	75.0	0.0	25.0
Condition tissue bearing areas for denture patient	93.9	4.1	2.0	94.0	2.0	4.0	100.0	0.0	0.0
*Perform root canal therapy/open canal/extirpate pulpectomy	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Instrument root canal	93.9	6.1	0.0	98.0	2.0	0.0	100.0	0.0	0.0
Measure root canal	81.6	16.3	2.0	92.0	4.0	4.0	100.0	0.0	0.0
*Enlarge root canal chemically	93.9	6.1	0.0	98.0	0.0	2.0	100.0	0.0	0.0
*Excavate carie using hand instrument	89.8	10.2	0.0	96.0	2.0	2.0	100.0	0.0	0.0
*Prepare tooth with pins for restoration with filling material	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Prepare tooth for cast restoration, e.g. full crown, jacket, etc.	89.8	8.2	2.0	100.0	0.0	0.0	100.0	0.0	0.0
*Prepare tooth for post	93.9	6.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 8 PATIENT CARE: ANESTHESIA AND MEDICATIONS	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Administer medicine intravenously	98.0	2.0	0.0	98.0	2.0	0.0	100.0	0.0	0.0
*Administer intravenous anesthetic	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Start I-V therapy via needle (not intracath, etc.)	98.0	0.0	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Regulate I-V flow	93.9	4.1	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Discontinue I-V therapy/clysis	98.0	0.0	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Give subcutaneous injection (SQ)	95.9	2.0	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Give intramuscular injection (IM)	93.9	4.1	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Give oxygen therapy, i.e. cannula/catheter/mask	81.6	4.1	14.3	86.0	2.0	12.0	100.0	0.0	0.0
Administer oral medication	91.8	0.0	8.2	78.0	4.0	18.0	100.0	0.0	0.0
Administer topical medication, e.g. ointment, salve	67.3	8.2	24.5	48.0	6.0	46.0	100.0	0.0	0.0
Administer topical anesthetic	69.4	4.1	26.5	50.0	6.0	44.0	100.0	0.0	0.0
Administer local/tissue infiltration anesthesia	89.8	6.1	4.1	90.0	4.0	6.0	100.0	0.0	0.0
*Administer spinal/caudal/epidermal anesthetic	98.0	2.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Write prescription for prescriber's signature	79.6	6.1	14.3	88.0	4.0	8.0	75.0	0.0	25.0
*Check and sign previously written prescription	100.0	0.0	0.0	96.0	4.0	0.0	62.5	12.5	25.0
Write prescription using own signature	100.0	0.0	0.0	100.0	0.0	0.0	87.5	0.0	12.5
Issue filled prescription	93.9	4.1	2.0	90.0	2.0	8.0	87.5	0.0	12.5
Dispense nonprescription (over the counter) drug	93.9	0.0	6.1	76.0	2.0	22.0	100.0	0.0	0.0
Check/count narcotics/controlled drugs	77.6	2.0	20.4	88.0	2.0	10.0	100.0	0.0	0.0
Perform accupuncture	100.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Perform cardiac resuscitation	79.6	6.1	14.3	84.0	8.0	8.0	100.0	0.0	0.0
Ventilate patient - mouth to mouth, etc.	73.5	2.0	24.5	78.0	4.0	18.0	100.0	0.0	0.0
Ventilate patient - ambubag/rebreathing bag	85.7	0.0	14.3	88.0	0.0	12.0	100.0	0.0	0.0
Ventilate patient - pressure/volume respirator	87.8	4.1	8.2	88.0	2.0	10.0	100.0	0.0	0.0
Hypnotize patient	100.0	0.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Mix chemical solution/pharmaceutical	87.8	0.0	12.2	88.0	0.0	12.0	100.0	0.0	0.0
Use standard references, e.g. PDR, technical manuals	73.5	2.0	24.5	76.0	0.0	24.0	62.5	0.0	37.5
Desensitize hypersensitive teeth	91.8	6.1	2.0	42.0	6.0	52.0	100.0	0.0	0.0
Administer block anesthesia to patient	89.8	8.2	2.0	92.0	4.0	4.0	100.0	0.0	0.0
Desensitize eroded areas of teeth	87.8	8.2	4.1	44.0	4.0	52.0	100.0	0.0	0.0
Store narcotics/controlled drugs/precious metals	73.5	6.1	20.4	88.0	2.0	10.0	87.5	0.0	12.5
Administer nitrous oxide analgesia	87.8	8.2	4.1	94.0	2.0	4.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 9 PATIENT CARE: SURGERY AND SURGICALLY RELATED	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Aspirate bone marrow	89.8	4.1	6.1	96.0	0.0	4.0	100.0	0.0	0.0
Aspirate cyst	89.8	8.2	2.0	96.0	2.0	2.0	100.0	0.0	0.0
Do cutdown (venous or arterial)	98.0	2.0	0.0	98.0	2.0	0.0	100.0	0.0	0.0
Incise and drain abscess	91.8	8.2	0.0	98.0	2.0	0.0	100.0	0.0	0.0
Perform biopsy	93.9	6.1	0.0	98.0	2.0	0.0	100.0	0.0	0.0
*Perform tracheotomy/tracheostomy	91.8	6.1	2.0	94.0	6.0	0.0	100.0	0.0	0.0
*Perform simple extraction of tooth	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform frenectomy	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Clean/debride wound/cut/ (not abrasion or burn)	85.7	4.1	10.2	88.0	4.0	8.0	100.0	0.0	0.0
Suture wound/incision (place sutures)	87.8	10.2	2.0	90.0	4.0	6.0	100.0	0.0	0.0
Control bleeding by direct pressure only	73.5	2.0	24.5	78.0	2.0	20.0	100.0	0.0	0.0
Control bleeding by ligation of vessel	95.9	4.1	0.0	98.0	2.0	0.0	100.0	0.0	0.0
Control bleeding by tourniquet	83.7	0.0	16.3	82.0	8.0	10.0	100.0	0.0	0.0
Remove sutures/skin clips	77.6	12.2	10.2	80.0	6.0	14.0	100.0	0.0	0.0
*Perform cauterization with bougie	98.0	2.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Perform cauterization chemically, e.g. silver nitrate	95.9	4.1	0.0	98.0	2.0	0.0	100.0	0.0	0.0
*Perform cauterization with hyphercater/dessicator	93.9	6.1	0.0	96.0	2.0	2.0	100.0	0.0	0.0
*Insert endotracheal tube	98.0	2.0	0.0	98.0	0.0	2.0	100.0	0.0	0.0
*Establish/maintain airway using needle into trachea	95.9	4.1	0.0	92.0	6.0	2.0	100.0	0.0	0.0
*Establish/maintain airway by using endotracheal tube	89.8	4.1	6.1	92.0	8.0	0.0	100.0	0.0	0.0
Scrub/gown/glove for surgery/sterile procedure	69.4	8.2	22.4	72.0	2.0	26.0	100.0	0.0	0.0
Apply coagulant or administer hemostatic	81.6	16.3	2.0	82.0	8.0	10.0	100.0	0.0	0.0
Retract oral tissues in surgical procedure	63.3	6.1	30.6	86.0	4.0	10.0	100.0	0.0	0.0
Remove medication from dry socket	87.8	6.1	6.1	90.0	2.0	8.0	100.0	0.0	0.0
Perform periodontal scaling/root planing	89.8	8.2	2.0	38.0	0.0	62.0	100.0	0.0	0.0
Treat postoperative dental hemorrhage	81.6	14.3	4.1	90.0	6.0	4.0	100.0	0.0	0.0
Check and remove periodontal pack	79.6	14.3	6.1	70.0	8.0	22.0	100.0	0.0	0.0
Apply periodontal pack	85.7	10.2	4.1	76.0	6.0	18.0	100.0	0.0	0.0
*Perform pulpotomy	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform apicoectomy	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform apical curettage	91.8	8.2	0.0	90.0	4.0	6.0	100.0	0.0	0.0
*Perform tooth hemisection	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 9 PATIENT CARE: SURGERY AND SURGICALLY RELATED	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Perform pulp cap	87.8	12.2	0.0	94.0	6.0	0.0	100.0	0.0	0.0
*Perform endosseous implant	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform serial extraction, arch change	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform serial extraction, routine	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Perform gingival curettage	91.8	6.1	2.0	58.0	8.0	34.0	100.0	0.0	0.0
*Perform gingivoplasty	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform gingivectomy	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform periodontal tissue graft	93.9	6.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform osseous surgery, includes flap entry and surgery	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform osseous graft	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Place periodontal pack	79.6	16.3	4.1	74.0	6.0	20.0	100.0	0.0	0.0
*Retract gingiva by radiosurgery	91.8	6.1	2.0	98.0	2.0	0.0	100.0	0.0	0.0
Recover root from soft tissue	91.8	4.1	4.1	96.0	2.0	2.0	100.0	0.0	0.0
*Recover root from bony tissue	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Remove cyst or mucocele	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Recover tooth/root from antrum	93.9	6.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Close oral antral fistula	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform tooth replantation	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform tooth implantation	93.9	6.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform tooth transplantation	93.9	6.1	0.0	98.0	0.0	2.0	100.0	0.0	0.0
*Surgically reposition tooth	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform surgical exposure of impacted or unerupted tooth	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform alveoplasty	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform alveolectomy	93.9	6.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
Perform direct dental fixation of fracture	95.9	4.1	0.0	98.0	2.0	0.0	100.0	0.0	0.0
*Perform indirect dental fixation of fracture	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform direct skeletal fixation of fracture	95.9	4.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform indirect skeletal fixation of fracture	98.0	2.0	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Set TMJ dislocation	93.9	6.1	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform flap for surgical extraction	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0
*Perform surgical extraction, full bony impaction	91.8	8.2	0.0	100.0	0.0	0.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 10 PATIENT CARE: IMPRESSIONS	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Select teeth for removable prosthetic appliance	77.6	8.2	14.3	98.0	0.0	2.0	12.5	25.0	62.5
Adjust occlusal rim on patient and obtain measurements	89.8	8.2	2.0	96.0	2.0	2.0	75.0	0.0	25.0
Make impression tray from preliminary impression	46.9	2.0	51.0	80.0	4.0	16.0	12.5	12.5	75.0
Construct custom impression tray	49.0	0.0	51.0	90.0	2.0	8.0	12.5	0.0	87.5
Prepare copper band for single tooth impression	69.4	12.2	18.4	96.0	0.0	4.0	62.5	12.5	25.0
Select shade and mold for crown/bridge	69.4	14.3	16.3	96.0	0.0	4.0	50.0	12.5	37.5
Hold impression in patient's mouth	51.0	4.1	44.9	52.0	4.0	44.0	100.0	0.0	0.0
Remove preliminary impression from patient's mouth	55.1	6.1	38.8	68.0	2.0	30.0	100.0	0.0	0.0
Take bite registration	73.5	10.2	16.3	86.0	2.0	12.0	87.5	0.0	12.5
Take copper band impression	75.5	12.2	12.2	96.0	0.0	4.0	75.0	12.5	12.5
Border mold/muscle trim custom tray	63.3	2.0	34.7	92.0	2.0	6.0	62.5	0.0	37.5
Take impression for denture reline	81.6	6.1	12.2	92.0	0.0	8.0	100.0	0.0	0.0
Select/try-in tray for impression	51.0	4.1	44.9	70.0	0.0	30.0	75.0	0.0	25.0
Coat teeth using syringe (hydrocolloid/silicone)	67.3	6.1	26.5	90.0	2.0	8.0	100.0	0.0	0.0
Paint impression material on teeth	83.7	0.0	16.3	88.0	0.0	12.0	100.0	0.0	0.0
Insert tray for final impression	67.3	10.2	22.4	72.0	4.0	24.0	100.0	0.0	0.0
Remove final impression from patient's mouth	63.3	8.2	28.6	74.0	2.0	24.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 11 PATIENT CARE: DENTAL LABORATORY WORK	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Carve and restore anatomical landmarks on dental restoration	71.4	14.3	14.3	84.0	2.0	14.0	50.0	0.0	50.0
Make temporary removable bite raiser	89.8	6.1	4.1	96.0	2.0	2.0	50.0	12.5	37.5
Make coping	91.8	2.0	6.1	96.0	2.0	2.0	25.0	12.5	62.5
Prepare/apply/characterize porcelain restoration	87.8	8.2	4.1	96.0	0.0	4.0	62.5	0.0	37.5
Flask/pack/cure/deflask complete/partial denture	95.9	0.0	4.1	94.0	2.0	4.0	12.5	12.5	75.0
Bake and finish porcelain restoration	93.9	2.0	4.1	98.0	0.0	2.0	50.0	0.0	50.0
Wax-up and carve inlay/crown/pontic	67.3	12.2	20.4	92.0	4.0	4.0	37.5	0.0	62.5
Set up artificial teeth on removable partial denture framework	91.8	4.1	4.1	94.0	2.0	4.0	25.0	12.5	62.5
Invest/burn out/cast framework for partial denture	91.8	4.1	4.1	94.0	4.0	2.0	25.0	12.5	62.5
Polish and finish partial denture framework	89.8	2.0	8.2	92.0	4.0	4.0	37.5	12.5	50.0
Duplicate complete denture	93.9	0.0	6.1	98.0	0.0	2.0	25.0	0.0	75.0
Pour final impressions to produce master cast	42.9	2.0	55.1	68.0	0.0	32.0	12.5	0.0	87.5
Characterize denture base material	93.9	0.0	6.1	94.0	2.0	4.0	12.5	0.0	87.5
Design post dam	85.7	6.1	8.2	98.0	0.0	2.0	25.0	12.5	62.5
Make baseplate and occlusal rim for complete denture	67.3	2.0	30.6	92.0	2.0	6.0	12.5	12.5	75.0
Fabricate artificial teeth for characterized denture	98.0	0.0	2.0	98.0	0.0	2.0	25.0	12.5	62.5
Remount complete denture for occlusal adjustment	91.8	2.0	6.1	98.0	0.0	2.0	37.5	12.5	50.0
Bead and box final impression	59.2	2.0	38.8	82.0	2.0	16.0	12.5	12.5	75.0
Prepare die from cast	73.5	4.1	22.4	94.0	0.0	6.0	25.0	12.5	62.5
Set up teeth in balanced occlusion for complete denture	91.8	4.1	4.1	96.0	2.0	2.0	37.5	12.5	50.0
Repair complete/partial denture, e.g. replace one or more teeth	89.8	4.1	6.1	98.0	0.0	2.0	12.5	12.5	75.0
*Construct palatal relief	95.9	2.0	2.0	100.0	0.0	0.0	50.0	0.0	50.0
Put post dam on master cast	85.7	4.1	10.2	96.0	0.0	4.0	37.5	0.0	62.5
Make trial baseplate/bite rim for partial denture	65.3	4.1	30.6	92.0	2.0	6.0	27.5	12 5	50.0
Pour cast from preliminary impression	42.9	0.0	57.1	92.0	2.0	6.0	37.5	12.5	50.0
Trim dental cast	44.9	0.0	55.1	76.0	0.0	24.0	12.5	12.5	75.0
Wax-up/shape/contour removable appliance for try-in/ final processing	93.9	0.0	6.1	96.0	2.0	2.0	25.0	0.0	75.0
Flask/pack/cure/deflask denture or partial reline/repair/ duplicate	91.8	4.1	4.1	94.0	4.0	2.0	12.5	12.5	75.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 11 PATIENT CARE: DENTAL LABORATORY WORK	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Remove teeth from metal framework	89.8	2.0	8.2	98.0	0.0	2.0	25.0	12.5	62.5
Dehydrate refractory cast	91.8	0.0	8.2	98.0	0.0	2.0	25.0	12.5	62.5
Duplicate master cast	63.3	2.0	34.7	90.0	2.0	8.0	25.0	12.5	62.5
Finish and polish metallic framework	87.8	2.0	10.2	92.0	0.0	8.0	37.5	0.0	62.5
Grind in tube teeth/facing	98.0	0.0	2.0	98.0	0.0	2.0	37.5	12.5	50.0
Pour refractory cast	79.6	4.1	16.3	92.0	0.0	8.0	37.5	12.5	50.0
Transfer design from master cast to refractory cast	95.9	0.0	4.1	98.0	0.0	2.0	25.0	12.5	62.5
Trim/wax-dip refractory cast of removable partial denture	95.9	0.0	4.1	98.0	0.0	2.0	25.0	12.5	62.5
Construct broken stress/precision attachment bridge	98.0	0.0	2.0	98.0	0.0	2.0	37.5	12.5	50.0
Make coping transfer	91.8	4.1	4.1	98.0	0.0	2.0	37.5	12.5	50.0
Construct bite raiser	93.9	0.0	6.1	96.0	0.0	4.0	50.0	0.0	50.0
Construct cleft palate splint/removable expansion appliance	98.0	0.0	2.0	98.0	0.0	2.0	87.5	0.0	12.5
Construct temporary removable partial denture	83.7	4.1	12.2	96.0	2.0	2.0	50.0	0.0	50.0
Make orthodontic space maintainer/retainer	83.7	2.0	14.3	98.0	0.0	2.0	62.5	0.0	37.5
Tripod/mark master cast	93.9	2.0	4.1	98.0	0.0	2.0	12.5	12.5	75.0
*Wax-up framework for partial denture	95.9	4.1	0.0	96.0	2.0	2.0	37.5	0.0	62.5
Invest wax pattern of partial denture	87.8	4.1	8.2	94.0	2.0	4.0	12.5	12.5	75.0
Sandblast partial denture framework casting	91.8	2.0	6.1	96.0	2.0	2.0	25.0	12.5	62.5
Solder chrome cobalt casting	93.9	2.0	4.1	98.0	0.0	2.0	37.5	0.0	62.5
Prepare cast for altered cast impression	83.7	6.1	10.2	96.0	0.0	4.0	50.0	0.0	50.0
Fabricate periodontic appliance	93.9	2.0	4.1	98.0	0.0	2.0	87.5	0.0	12.5
*Fabricate wrought metal framework	95.9	2.0	2.0	100.0	0.0	0.0	75.0	0.0	25.0
Mount final cast to adjustable articulator	83.7	6.1	10.2	96.0	0.0	4.0	12.5	0.0	87.5
Construct patient remount matrix	87.8	4.1	8.2	96.0	0.0	4.0	75.0	0.0	25.0
Fabricate surgical template	93.9	4.1	2.0	98.0	0.0	2.0	50.0	12.5	37.5
Fabricate orthodontic appliance, e.g. Hawley	77.6	6.1	16.3	98.0	0.0	2.0	75.0	12.5	12.5
Prepare matrix for repairs	81.6	0.0	18.4	94.0	2.0	4.0	62.5	0.0	37.5
Construct copper plated die and trim	93.9	2.0	4.1	96.0	2.0	2.0	37.5	12.5	50.0
Make amalgam die, ditch and trim	89.8	4.1	6.1	98.0	0.0	2.0	50.0	12.5	37.5
Cast crown/bridge/inlay in gold	73.5	4.1	22.4	92.0	2.0	6.0	37.5	12.5	50.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 11 PATIENT CARE: DENTAL LABORATORY WORK	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Sandblast gold appliance	91.8	0.0	8.2	96.0	2.0	2.0	37.5	0.0	62.5
Pickle casting	69.4	2.0	28.6	86.0	0.0	14.0	12.5	12.5	75.0
Replace broken facing	77.6	6.1	16.3	92.0	4.0	4.0	37.5	0.0	62.5
Solder bridge	89.8	4.1	6.1	96.0	2.0	2.0	37.5	12.5	50.0
Invest bridge for soldering	89.8	2.0	8.2	96.0	2.0	2.0	25.0	12.5	62.5
Make temporary bridge/splint	83.7	4.1	12.2	98.0	0.0	2.0	50.0	0.0	50.0
Grind/polish crown	81.6	4.1	14.3	92.0	2.0	6.0	25.0	12.5	62.5
Wax-up/flask process acrylic facing/crown/bridge	91.8	0.0	8.2	94.0	2.0	4.0	37.5	0.0	62.5
*Solder contact on crown	91.8	6.1	2.0	98.0	2.0	0.0	25.0	0.0	75.0
Make soldering index	91.8	4.1	4.1	94.0	4.0	2.0	37.5	12.5	50.0
Process acrylic facing on bridge	91.8	4.1	4.1	98.0	0.0	2.0	37.5	12.5	50.0
Disassemble bridge	89.8	4.1	6.1	98.0	0.0	2.0	62.5	0.0	37.5
Reset teeth for complete/partial denture	95.9	2.0	2.0	98.0	0.0	2.0	25.0	12.5	62.5
Add teeth to complete/partial denture	93.9	2.0	4.1	98.0	0.0	2.0	25.0	12.5	62.5
Replace broken clasp with new clasp	93.9	2.0	4.1	98.0	0.0	2.0	37.5	0.0	62.5
Weld/solder orthodontic band	83.7	2.0	14.3	94.0	2.0	4.0	75.0	12.5	12.5
Fit orthodontic band, indirect	89.8	2.0	8.2	96.0	2.0	2.0	75.0	12.5	12.5
Fit preformed orthodontic band, indirect	87.8	2.0	10.2	96.0	0.0	4.0	87.5	12.5	0.0
Make arch wire	87.8	2.0	10.2	96.0	0.0	4.0	87.5	0.0	12.5
Make periodontal appliance	93.9	2.0	4.1	98.0	0.0	2.0	87.5	12.5	0.0
Prepare necessary ingredients for dental casting	71.4	4.1	24.5	90.0	0.0	10.0	12.5	12.5	75.0
Make tooth guidance appliance	95.9	0.0	4.1	98.0	0.0	2.0	62.5	0.0	37.5
Make habit control device	95.9	0.0	4.1	98.0	0.0	2.0	75.0	0.0	25.0
Prepare orthodontic retainer	85.7	2.0	12.2	96.0	2.0	2.0	50.0	12.5	37.5
Soap model	67.3	0.0	32.7	80.0	0.0	20.0	50.0	0.0	50.0
*Construct dental splint, provisional	85.7	4.1	10.2	98.0	2.0	0.0	50.0	0.0	50.0
Construct dental splint, plastic	89.8	0.0	10.2	98.0	0.0	2.0	75.0	0.0	25.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 12 PATIENT CARE: INSERTIONS AND RESTORATIONS	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Make temporary acrylic resin jacket crown	83.7	2.0	14.3	98.0	0.0	2.0	37.5	0.0	62.5
Place amalgam in cavity preparation	65.3	20.4	14.3	82.0	4.0	14.0	100.0	0.0	0.0
Place gold foil	85.7	10.2	4.1	94.0	4.0	2.0	100.0	0.0	0.0
Insert temporary cement	81.6	4.1	14.3	84.0	2.0	14.0	100.0	0.0	0.0
Condense amalgam restoration	69.4	14.3	16.3	84.0	4.0	12.0	100.0	0.0	0.0
Carve amalgam restoration	73.5	12.2	14.3	82.0	6.0	12.0	100.0	0.0	0.0
Mallet gold foil	79.6	8.2	12.2	94.0	4.0	2.0	87.5	12.5	0.0
Polish and finish amalgam restoration	73.5	12.2	14.3	66.0	4.0	30.0	100.0	0.0	0.0
Insert temporary bridge	77.6	18.4	4.1	92.0	2.0	6.0	100.0	0.0	0.0
Insert temporary crown, e.g., plastic, aluminum	81.6	14.3	4.1	86.0	4.0	10.0	87.5	0.0	12.5
Curette/irrigate/pack dry socket	89.8	10.2	0.0	96.0	4.0	0.0	100.0	0.0	0.0
Insert temporary sedative filling in carious tooth	79.6	12.2	8.2	84.0	2.0	14.0	100.0	0.0	0.0
Apply temporary splint to fractured teeth	93.9	4.1	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Insert fixed space maintainer	87.8	8.2	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Insert removable space maintainer	91.8	4.1	4.1	94.0	0.0	6.0	100.0	0.0	0.0
Insert tooth guidance appliance	89.8	4.1	6.1	96.0	0.0	4.0	100.0	0.0	0.0
*Insert habit control device	89.8	10.2	0.0	90.0	6.0	4.0	87.5	0.0	12.5
Apply pit/fissure sealant	83.7	10.2	6.1	76.0	4.0	20.0	100.0	0.0	0.0
Remove temporary crown/jacket	79.6	6.1	14.3	90.0	4.0	6.0	100.0	0.0	0.0
Try-in cast restoration	89.8	8.2	2.0	94.0	4.0	2.0	100.0	0.0	0.0
Insert/cement cast restoration	85.7	10.2	4.1	92.0	4.0	4.0	100.0	0.0	0.0
Try-in fixed bridge/splint	89.8	8.2	2.0	94.0	2.0	4.0	87.5	0.0	12.5
Insert relined denture	89.8	8.2	2.0	94.0	0.0	6.0	100.0	0.0	0.0
Condense gold foil	87.8	10.2	2.0	94.0	4.0	2.0	87.5	0.0	12.5
Finish silicate/acrylic/plastic restoration	79.6	10.2	10.2	84.0	8.0	8.0	37.5	0.0	62.5
Finish and polish gold foil restoration	85.7	8.2	6.1	96.0	2.0	2.0	100.0	0.0	0.0
Remove overhanging margin of filling	87.8	8.2	4.1	78.0	4.0	18.0	100.0	0.0	0.0
Try-in partial framework	93.9	2.0	4.1	96.0	0.0	4.0	100.0	0.0	0.0
Try-in full denture with teeth set in wax	87.8	8.2	4.1	96.0	2.0	2.0	100.0	0.0	0.0
Try-in partial denture with teeth set in wax	89.8	8.2	2.0	96.0	0.0	4.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 12 PATIENT CARE: INSERTIONS AND RESTORATIONS	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Try-in complete immediate denture set in wax	89.8	8.2	2.0	96.0	0.0	4.0	100.0	0.0	0.0
*Perform retrofilling	93.9	6.1	0.0	98.0	0.0	2.0	100.0	0.0	0.0
Fill root canal	93.9	6.1	0.0	98.0	2.0	0.0	100.0	0.0	0.0
*Change pulp dressing after therapy	93.9	6.1	0.0	96.0	2.0	2.0	100.0	0.0	0.0
Fit removable orthodontic appliance	87.8	10.2	2.0	98.0	0.0	2.0	75.0	12.5	12.5
Fit fixed orthodontic appliance	93.9	4.1	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Install removable orthodontic appliance	91.8	4.1	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Install fixed orthodontic appliance	89.8	6.1	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Fit preformed orthodontic band, direct	91.8	4.1	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Cement preformed orthodontic band	81.6	10.2	8.2	96.0	2.0	2.0	100.0	0.0	0.0
*Place arch wire	91.8	6.1	2.0	98.0	2.0	0.0	100.0	0.0	0.0
Install head gear	89.8	6.1	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Deliver orthodontic retainer	87.8	6.1	6.1	92.0	0.0	8.0	62.5	0.0	37.5
Place provisional splint, intracoronal	91.8	6.1	2.0	98.0	0.0	2.0	100.0	0.0	0.0
*Place provisional splint, extracoronal	95.9	4.1	0.0	100.0	0.0	0.0	75.0	0.0	25.0
Remove temporary/sedative filling	81.6	10.2	8.2	82.0	4.0	14.0	100.0	0.0	0.0
Insert silicate/acrylic/plastic restoration	75.5	8.2	16.3	90.0	2.0	8.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 13 PATIENT CARE: ADJUSTMENTS AND REPAIRS	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Insert cement base into excavated cavity	75.5	10.2	14.3	86.0	4.0	10.0	100.0	0.0	0.0
Insert pulp cap into excavated cavity	85.7	6.1	8.2	92.0	4.0	4.0	100.0	0.0	0.0
Smooth/polish restoration	69.4	14.3	16.3	56.0	4.0	40.0	25.0	12.5	62.5
Apply temporary sedative crown to fractured tooth	87.8	8.2	4.1	92.0	0.0	8.0	100.0	0.0	0.0
Insert/remove complete/partial denture	87.8	6.1	6.1	84.0	0.0	16.0	100.0	0.0	0.0
Clean/polish removable appliance	63.3	0.0	36.7	42.0	2.0	56.0	25.0	12.5	62.5
Adjust wrought gold clasp and bar	91.8	6.1	2.0	98.0	0.0	2.0	62.5	0.0	37.5
Repair complete/partial denture (no teeth damaged)	87.8	4.1	8.2	94.0	4.0	2.0	12.5	12.5	75.0
Bend wire for clasp	93.9	0.0	6.1	96.0	0.0	4.0	50.0	0.0	50.0
Perform selective grinding of denture	89.8	4.1	6.1	96.0	0.0	4.0	12.5	12.5	75.0
Perform occlusal equilibration	91.8	8.2	0.0	98.0	2.0	0.0	62.5	0.0	37.5
Reduce sharp edges of fractured tooth	91.8	4.1	4.1	90.0	4.0	6.0	62.5	12.5	25.0
Adjust space maintainer	89.8	8.2	2.0	98.0	0.0	2.0	62.5	0.0	37.5
Remove fixed space maintainer	93.9	2.0	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Adjust tooth guidance appliance	91.8	4.1	4.1	96.0	0.0	4.0	75.0	0.0	25.0
Remove tooth guidance appliance	93.9	0.0	6.1	96.0	0.0	4.0	100.0	0.0	0.0
Remove habit control device	89.8	2.0	8.2	94.0	2.0	4.0	100.0	0.0	0.0
Adjust habit control device	98.0	0.0	2.0	96.0	2.0	2.0	100.0	0.0	0.0
Fit temporary bridge/splint	87.8	8.2	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Adjust fixed bridge/splint	89.8	10.2	0.0	98.0	2.0	0.0	87.5	0.0	12.5
Adjust partial framework	93.9	2.0	4.1	98.0	0.0	2.0	37.5	0.0	62.5
Adjust removable orthodontic appliance	91.8	2.0	6.1	96.0	0.0	4.0	75.0	0.0	25.0
Adjust fixed orthodontic appliance	91.8	4.1	4.1	96.0	0.0	4.0	75.0	12.5	12.5
Adjust preformed orthodontic band	89.8	2.0	8.2	98.0	0.0	2.0	100.0	0.0	0.0
Perform full banded adjustment, e.g. arch change	93.9	4.1	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Perform full banded adjustment, routine	93.9	4.1	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Perform head gear adjustment	89.8	6.1	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Perform retention, routine	93.9	6.1	0.0	98.0	2.0	0.0	100.0	0.0	0.0
Perform retention supervision	93.9	4.1	2.0	96.0	0.0	4.0	100.0	0.0	0.0
Remove orthodontic appliance/band	85.7	6.1	8.2	98.0	0.0	2.0	100.0	0.0	0.0
Perform emergency orthodontic repair	89.8	2.0	8.2	98.0	0.0	2.0	87.5	0.0	12.5
Make occlusal adjustment/selective grinding on natural teeth	91.8	8.2	0.0	98.0	2.0	0.0	75.0	0.0	25.0
Adjust provisional dental splint	91.8	6.1	2.0	98.0	0.0	2.0	62.5	25.0	12.5

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 14 PATIENT CARE: CHAIRSIDE ASSISTING AND CLINICAL SUPPORT	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Take and record temperature (oral)	81.6	0.0	18.4	84.0	0.0	16.0	100.0	0.0	0.0
Take blood pressure	83.7	0.0	16.3	84.0	0.0	16.0	100.0	0.0	0.0
Take pulse/respiration	81.6	4.1	14.3	74.0	4.0	22.0	100.0	0.0	0.0
Develop x-ray film	51.0	0.0	49.0	48.0	2.0	50.0	100.0	0.0	0.0
Load/unload film cassettes	69.4	0.0	30.6	80.0	2.0	18.0	100.0	0.0	0.0
Apply cold to reduce swelling/relieve pain/treat burn	75.5	0.0	24.5	84.0	2.0	14.0	100.0	0.0	0.0
Provide care in patient's home/nursing home (with an accompanying doctor)	87.8	0.0	12.2	66.0	0.0	34.0	100.0	0.0	0.0
Gown and glove others	79.6	4.1	16.3	92.0	0.0	8.0	100.0	0.0	0.0
Prepare/drape/gown patient for examination/treatment	53.1	0.0	46.9	50.0	0.0	50.0	100.0	0.0	0.0
Prepare sterile tray for injection/minor surgery	61.2	0.0	38.8	82.0	0.0	18.0	100.0	0.0	0.0
Prepare non sterile tray, e.g. special examination	59.2	0.0	40.8	60.0	2.0	38.0	100.0	0.0	0.0
Obtain equipment/medications/instruments P.R.N. for personnel performing sterile procedure	71.4	2.0	26.5	76.0	0.0	24.0	100.0	0.0	0.0
Scrub and assist with surgery/sterile procedure	55.1	4.1	40.8	78.0	2.0	20.0	100.0	0.0	0.0
Operate suctioning equipment	57.1	0.0	42.9	54.0	8.0	38.0	100.0	0.0	0.0
Open sterile packages/packs	55.1	0.0	44.9	54.0	0.0	46.0	100.0	0.0	0.0
Prepare skin site for minor surgery/treatment, e.g. shave	87.8	2.0	10.2	96.0	0.0	4.0	100.0	0.0	0.0
Hold patient during examination/treatment/x-ray	79.6	2.0	18.4	76.0	0.0	24.0	100.0	0.0	0.0
Make individual surgical tray for immediate denture	79.6	0.0	20.4	96.0	0.0	4.0	37.5	12.5	50.0
Prepare/mix impression material	44.9	0.0	55.1	64.0	4.0	32.0	50.0	12.5	37.5
Trim stone/plaster model	46.9	0.0	53.1	66.0	4.0	30.0	12.5	0.0	87.5
Stabilize patient's mandible during operation	69.4	2.0	28.6	78.0	2.0	20.0	100.0	0.0	0.0
Apply water to tooth during cavity preparation	61.2	2.0	36.7	80.0	4.0	16.0	100.0	0.0	0.0
Heat/prepare gutta percha for temporary stopping	63.3	4.1	32.7	88.0	2.0	10.0	100.0	0.0	0.0
Insert/remove cotton rolls	61.2	0.0	38.8	34.0	2.0	64.0	100.0	0.0	0.0
Aspirate during oral surgery	59.2	4.1	36.7	78.0	2.0	20.0	100.0	0.0	0.0
Apply air to keep cavity preparation dry	57.1	0.0	42.9	78.0	4.0	18.0	100.0	0.0	0.0
Evacuate oral cavity during restorative procedure	59.2	0.0	40.8	80.0	4.0	16.0	100.0	0.0	0.0
Prepare set-up for local anesthetic injection	61.2	0.0	38.8	62.0	6.0	32.0	100.0	0.0	0.0

TABLE F-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 14 PATIENT CARE: CHAIRSIDE ASSISTING AND CLINICAL SUPPORT	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Mix/triturate amalgam-alloy	42.9	0.0	57.1	78.0	6.0	16.0	87.5	0.0	12.5
Prepare setup for gold foil restoration	63.3	4.1	32.7	88.0	6.0	6.0	100.0	0.0	0.0
Prepare tray setup for dental procedure	49.0	0.0	51.0	78.0	2.0	20.0	87.5	0.0	12.5
Fill tray for impression	42.9	0.0	57.1	62.0	2.0	36.0	75.0	12.5	12.5
Remove excess cement from crowns of the teeth	73.5	8.2	18.4	64.0	8.0	28.0	87.5	0.0	12.5
Prepare patient for injection	63.3	4.1	32.7	86.0	2.0	12.0	100.0	0.0	0.0
Mix silicate cement	42.9	0.0	57.1	80.0	4.0	16.0	75.0	0.0	25.0
Help patient to rinse/expectorate during dental procedure	57.1	0.0	42.9	34.0	2.0	64.0	100.0	0.0	0.0
Remove temporary bridge	81.6	10.2	8.2	92.0	2.0	6.0	100.0	0.0	0.0
Adapt rubber dam to one tooth	61.2	8.2	30.6	80.0	4.0	16.0	100.0	0.0	0.0
Adapt rubber dam to more than one tooth	61.2	6.1	32.7	82.0	8.0	10.0	100.0	0.0	0.0
Adapt matrix band and retainer to teeth	57.1	16.3	26.5	88.0	2.0	10.0	100.0	0.0	0.0
Mix acrylic resin for dental restoration	51.0	0.0	49.0	78.0	6.0	16.0	25.0	0.0	75.0
Mix zinc phosphate for dental restoration	42.9	0.0	57.1	74.0	6.0	20.0	75.0	12.5	12.5
Set up unit bracket table with dental instrument/material	49.0	0.0	51.0	48.0	0.0	52.0	100.0	0.0	0.0
Exchange bur/mandrel/mounted stone/diamond in dental handpiece	51.0	0.0	49.0	76.0	0.0	24.0	25.0	12.5	62.5
Load/pass amalgam carrier to dentist	49.0	0.0	51.0	80.0	6.0	14.0	100.0	0.0	0.0
Apply varnish to prepared tooth	71.4	6.1	22.4	88.0	2.0	10.0	100.0	0.0	0.0
Place matrix band in holder	55.1	0.0	44.9	80.0	10.0	10.0	75.0	12.5	12.5
Place wedge	65.3	12.2	22.4	88.0	2.0	10.0	100.0	0.0	0.0
Remove wedge and matrix band	61.2	12.2	26.5	86.0	2.0	12.0	100.0	0.0	0.0
Remove rubber dam	59.2	2.0	38.8	78.0	6.0	16.0	100.0	0.0	0.0
Remove provisional splint, intracoronal	91.8	4.1	4.1	98.0	0.0	2.0	100.0	0.0	0.0
Remove provisional splint, extracoronal	93.9	4.1	2.0	98.0	0.0	2.0	100.0	0.0	0.0
Pass and receive instruments at chairside	51.0	0.0	49.0	74.0	4.0	22.0	100.0	0.0	0.0
Prepare premixed base, e.g. dycal, cavitec	46.9	0.0	53.1	86.0	2.0	12.0	100.0	0.0	0.0
Retract gingiva with cord	81.6	8.2	10.2	96.0	2.0	2.0	100.0	0.0	0.0
Fill tray for preliminary impression	40.8	0.0	59.2	66.0	2.0	32.0	100.0	0.0	0.0
Remove plaster/stone cast from impression after setting	42.9	0.0	57.1	72.0	0.0	28.0	12.5	12.5	75.0

TABLE 4-1--Continued

RESPONSIBILITY (COMPETENCY) LEVEL TO WHICH DENTAL TASKS ARE TAUGHT BY FACULTY AND BY PROGRAM

CATEGORY 14 PATIENT CARE: CHAIRSIDE ASSISTING AND CLINICAL SUPPORT	DENTAL ASSISTING N=49			DENTAL HYGIENE N=50			DENTAL LABORATORY TECHNICIAN N=8		
	NR-1	2	3-4	NR-1	2	3-4	NR-1	2	3-4
Prepare filling tray for final impression	55.1	0.0	44.9	82.0	2.0	16.0	50.0	0.0	50.0
Prepare hydrocolloid, water bath	57.1	6.1	36.7	86.0	2.0	12.0	75.0	0.0	25.0
Fill syringe (hydrocolloid/silicone/rubber)	49.0	0.0	51.0	84.0	4.0	12.0	100.0	0.0	0.0
Irrigate mouth/oral cavity	59.2	0.0	40.8	42.0	2.0	56.0	100.0	0.0	0.0
Remove fluid from surgical site with sponges or suction	57.1	4.1	38.8	78.0	2.0	20.0	100.0	0.0	0.0
Mount small x-ray (dental/etc.)	51.0	0.0	49.0	48.0	0.0	52.0	100.0	0.0	0.0
Assemble/index/file x-ray films	57.1	0.0	42.9	66.0	0.0	34.0	87.5	0.0	12.5
Update radiologic diagnostic index	81.6	6.1	12.2	92.0	0.0	8.0	100.0	0.0	0.0
Review/inspect x-ray film for disposal	63.3	2.0	34.7	70.0	4.0	26.0	100.0	0.0	0.0
Place rubber dam clamp on tooth	59.2	12.2	28.6	74.0	4.0	22.0	87.5	12.5	0.0

APPENDIX G

RESPONSIBILITY RESPONSE AGREEMENTS BY COMBINED HIGHEST RESPONSE FROM EACH DENTAL AUXILIARY

TABLE G-1

RESPONSIBILITY RESPONSE AGREEMENT OF ALL DENTAL AUXILIARY FACULTIES TO 563 DENTAL TASKS BY COMBINED HIGHEST RESPONSE FROM EACH AUXILIARY

19 AUXILIARY EDUCATION PROGRAMS IN COMMUNITY COLLEGES, TECHNICAL INSTITUTE AND SENIOR INSTITUTIONS	RESPONSIBILITY* LEVELS NR-1 N	NR-1 %	2 N	2 %	3-4 N	3-4 %	ROW TOTALS N
Dental Hygiene			**Dental Assisting**				
NR-1 Level	3	0.5	37	6.6	4	0.7	44
2 Level	1	0.2	18	3.2	7	1.2	26
3-4 Level	0	0.0	16	2.8	477	84.7	493
Column Totals	4	0.7	71	12.6	488	86.7	563
Dental Assisting			**Dental Laboratory Technician**				
NR-1 Level	2	0.4	0	0.0	2	0.4	4
2 Level	62	11.0	0	0.0	9	1.6	71
3-4 Level	293	52.0	10	1.8	185	32.9	488
Column Totals	357	63.4	10	1.8	196	34.8	563
Dental Laboratory Technician			**Dental Hygiene**				
NR-1 Level	40	7.1	18	3.2	299	53.1	357
2 Level	0	0.0	0	0.0	10	1.8	10
3-4 Level	4	0.7	8	1.4	184	32.7	196
Column Totals	44	7.8	26	4.6	493	87.6	563

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility.

TABLE G-2

RESPONSIBILITY RESPONSE AGREEMENT OF COMMUNITY COLLEGE AND TECHNICAL INSTITUTE DENTAL AUXILIARY FACULTIES TO 563 DENTAL TASKS BY COMBINED HIGHEST RESPONSE FROM EACH AUXILIARY

FROM 15 COMMUNITY COLLEGE AND TECHNICAL INSTITUTE PROGRAMS	RESPONSIBILITY* LEVELS NR-1 N	NR-1 %	2 N	2 %	3-4 N	3-4 %	ROW TOTALS N
Dental Hygiene			Dental Assisting				
NR-1 Level	13	2.3	83	14.7	41	7.3	137
2 Level	2	0.4	12	2.1	25	4.4	39
3-4 Level	3	0.5	31	5.5	353	62.7	387
Column Totals	18	3.2	126	22.4	419	74.4	563
Dental Assisting			Dental Laboratory Technician				
NR-1 Level	12	2.1	0	0.0	6	1.1	18
2 Level	104	18.5	0	0.0	22	3.9	126
3-4 Level	241	42.8	10	1.8	168	29.8	419
Column Totals	357	63.4	10	1.8	196	34.8	563
Dental Laboratory Technician			Dental Hygiene				
NR-1 Level	86	15.3	15	2.7	256	45.5	357
2 Level	1	0.2	1	0.2	8	1.4	10
3-4 Level	50	8.9	23	4.1	123	21.8	196
Column Totals	137	24.3	39	6.9	387	68.7	563

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility.

APPENDIX H

RESPONSIBILITY RESPONSES, BY CATEGORY, OF FACULTY AND PRECEPTORS OF THREE DENTAL AUXILIARY EDUCATION PROGRAMS

TABLE H-1

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 1. BUSINESS AND OFFICE MANAGEMENT (87 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	5	1	94	4	10	8	82
002	5	76	5	20	9	6	1	93
003	4	29	5	67	8	3	1	95
006	6	74	1	25	10	5	0	95
009	5	13	0	87	23	0	1	99
010	3	14	6	80	13	0	3	97
011	2	30	1	69	3	16	3	80
012	3	15	2	83	16	0	0	100
013	8	10	2	87	0**			
014	10	3	1	95	19	0	0	100
Certificate Programs in Community College	31	0	1	99	86	0	0	100
Certificate Programs in Dental Schools	18	1	1	98	19	0	0	100
ALL Programs	49	0	0	100	105	0	0	100
Dental Hygiene								
002	6	67	0	33				
005	5	56	2	41				
006	7	67	1	32				
007	5	18	5	77				
008	5	5	0	95				
014	12	7	1	92				
015	10	28	15	57				
Associate Degree Programs in C. C. & Technical Institutes	28	1	0	99				
Certificate Programs in Dental Schools	10	28	15	57				
Baccalaureate Degree Programs in Dental Schools	12	7	1	92				
ALL Programs	50	1	0	99				
Dental Laboratory Technician								
001	3	71	0	29				
005	5	76	7	17				
Associate Degree Programs in C. C. & Technical Institutes	8	62	5	33				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 8% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 2. HOUSEKEEPING -- CLINICAL AND GENERAL (16 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY N	LEVEL OF RESPONSIBILITY* NR-1 %	2 %	3-4 %	PRECEPTORS N	LEVEL OF RESPONSIBILITY NR-1 %	2 %	3-4 %
Dental Assisting								
001	3	5	1	94	4	0	0	100
002	5	6	0	94	9	0	0	100
003	4	0	0	100	8	0	0	100
006	6	13	0	88	10	0	0	100
009	5	0	0	100	23	0	0	100
010	3	6	0	94	13	0	0	100
011	2	13	0	87	3	6	0	94
012	3	0	0	100	16	0	0	100
013	8	0	0	100	0**			
014	10	0	0	100	19	0	0	100
Certificate Programs in Community College	31	0	0	100	86	0	0	100
Certificate Programs in Dental Schools	18	0	0	100	19	0	0	100
ALL Programs	49	0	0	100	105	0	0	100
Dental Hygiene								
002	6	0	0	100				
005	5	0	0	100				
006	7	0	0	100				
007	5	0	0	100				
008	5	0	0	100				
014	12	0	0	100				
015	10	0	0	100				
Associate Degree Programs in C. C. & Technical Institutes	28	0	0	100				
Certificate Programs in Dental Schools	10	0	0	100				
Baccalaureate Degree Programs in Dental Schools	12	0	0	100				
ALL Programs	50	0	0	100				
Dental Laboratory Technician								
001	3	56	0	44				
005	5	50	0	50				
Associate Degree Programs in C. C. & Technical Institutes	8	44	0	56				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 0% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 3. PATIENT CARE: RECORDS -- DENTAL, MEDICAL (12 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	0	0	100	4	0	0	100
002	5	0	17	83	9	0	0	100
003	4	8	0	92	8	0	0	100
006	6	0	0	100	10	0	0	100
009	5	0	0	100	23	0	0	100
010	3	0	0	100	13	0	0	100
011	2	0	0	100	3	0	0	100
012	3	0	0	100	16	0	0	100
013	8	0	0	100	0**			
014	10	0	0	100	19	0	0	100
Certificate Programs in Community College	31	0	0	100	86	0	0	100
Certificate Programs in Dental Schools	18	0	0	100	19	0	0	100
ALL Programs	49	0	0	100	105	0	0	100
Dental Hygiene								
002	6	0	0	100				
005	5	0	0	100				
006	7	0	0	100				
007	5	0	0	100				
008	5	0	0	100				
014	12	0	0	100				
015	10	0	0	100				
Associate Degree Programs in C. C. & Technical Institutes	28	0	0	100				
Certificate Programs in Dental Schools	10	0	0	100				
Baccalaureate Degree Programs in Dental Schools	12	0	0	100				
ALL Programs	50	0	0	100				
Dental Laboratory Technician								
001	3	83	8	8				
005	5	100	0	0				
Associate Degree Programs in C. C. & Technical Institutes	8	83	8	8				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 0% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 4. PATIENT CARE: EXAMINATION--INCLUDING DIAGNOSTIC TESTS & X-RAY (39 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	51	5	44	4	46	13	41
002	5	56	13	31	9	36	8	56
003	4	59	13	28	8	46	5	49
006	6	49	8	44	10	31	15	54
009	5	10	33	56	23	15	15	69
010	3	28	36	36	13	23	13	64
011	2	77	0	23	3	67	10	23
012	3	38	28	33	16	18	18	64
013	8	18	10	72	0**			
014	10	3	13	84	19	18	8	74
Certificate Programs in Community College	31	8	21	72	86	3	8	90
Certificate Programs in Dental Schools	18	3	10	87	19	18	8	74
ALL Programs	49	0	10	90	105	3	3	95
Dental Hygiene								
002	6	28	5	67				
005	5	46	5	49				
006	7	26	13	62				
007	5	36	0	64				
008	5	8	0	92				
014	12	0	3	97				
015	10	10	3	87				
Associate Degree Programs in C. C. & Technical Institutes	28	8	0	92				
Certificate Programs in Dental Schools	10	10	3	87				
Baccalaureate Degree Programs in Dental Schools	12	0	3	97				
ALL Programs	50	0	0	100				
Dental Laboratory Technician								
001	3	100	0	0				
005	5	92	0	8				
Associate Degree Programs in C. C. & Technical Institutes	8	92	0	8				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 13% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 5. PATIENT CARE: ANALYSIS, TREATMENT PLANNING, AND CONSULTATION (27 TASKS)

DENTAL AUXILIARY PROGRAMS BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	37	7	56	4	33	33	33
002	5	70	19	11	9	22	11	67
003	4	52	4	44	8	26	4	70
006	6	44	19	37	10	41	11	48
009	5	22	22	56	23	11	19	70
010	3	22	30	48	13	22	15	63
011	2	85	0	15	3	56	7	37
012	3	48	15	37	16	15	19	68
013	8	44	7	48	0**			
014	10	4	11	85	19	19	11	70
Certificate Programs in Community College	31	7	15	78	86	0	7	93
Certificate Programs in Dental Schools	18	4	7	90	19	19	11	70
ALL Programs	49	0	7	93	105	0	7	93
Dental Hygiene								
002	6	41	4	56				
005	5	67	4	30				
006	7	30	7	63				
007	5	30	0	70				
008	5	19	4	78				
014	12	0	11	89				
015	10	22	4	74				
Associate Degree Programs in C. C. & Technical Institutes	28	11	4	85				
Certificate Programs in Dental Schools	10	22	4	74				
Baccalaureate Degree Programs in Dental Schools	12	0	11	89				
ALL Programs	50	0	4	96				
Dental Laboratory Technician								
001	3	74	0	26				
005	5	74	4	22				
Associate Degree Programs in C. C. & Technical Institutes	8	67	0	33				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 33% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 6. PATIENT CARE: PREVENTIVE AND PATIENT EDUCATION (25 TASKS)

DENTAL AUXILIARY PROGRAMS BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	12	8	80	4	16	16	68
002	5	44	40	16	9	0	4	96
003	4	40	8	52	8	4	8	88
006	6	32	0	68	10	0	4	96
009	5	0	20	80	23	0	0	100
010	3	0	40	60	13	4	4	92
011	2	32	0	68	3	40	0	60
012	3	12	8	80	16	0	4	96
013	8	16	8	76	0**			
014	10	0	0	100	19	0	0	100
Certificate Programs in Community College	31	0	12	88	86	0	0	100
Certificate Programs in Dental Schools	18	0	0	100	19	0	0	100
ALL Programs	49	0	0	100	105	0	0	100
Dental Hygiene								
002	6	4	0	96				
005	5	4	0	96				
006	7	0	0	100				
007	5	0	4	96				
008	5	0	0	100				
014	12	0	0	100				
015	10	4	0	96				
Associate Degree Programs in C. C. & Technical Institutes	28	0	0	100				
Certificate Programs in Dental Schools	10	4	0	96				
Baccalaureate Degree Programs in Dental Schools	12	0	0	100				
ALL Programs	50	0	0	100				
Dental Laboratory Technician								
001	3	84	4	12				
005	5	100	0	0				
Associate Degree Programs in C. C. & Technical Institutes	8	84	4	12				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 16% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 7. PATIENT CARE: PREPARATION (13 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	92	8	0	4	23	38	38
002	5	8	92	0	9	77	0	23
003	4	92	8	0	8	69	23	8
006	6	62	38	0	10	69	15	15
009	5	0	92	8	23	0	15	84
010	3	8	92	0	13	31	62	8
011	2	100	0	0	3	100	0	0
012	3	46	38	15	16	46	38	15
013	8	100	0	0	0**			
014	10	69	23	8	19	62	8	31
Certificate Programs in Community College	31	0	77	23	86	0	0	100
Certificate Programs in Dental Schools	18	69	23	8	19	62	8	31
ALL Programs	49	0	69	31	105	0	0	100
Dental Hygiene								
002	6	92	0	8				
005	5	92	8	0				
006	7	85	15	0				
007	5	100	0	0				
008	5	100	0	0				
014	12	46	31	23				
015	10	85	8	8				
Associate Degree Programs in C. C. & Technical Institutes	28	77	15	8				
Certificate Programs in Dental Schools	10	85	8	8				
Baccalaureate Degree Programs in Dental Schools	12	46	31	23				
ALL Programs	50	38	31	31				
Dental Laboratory Technician								
001	3	92	0	8				
005	5	92	0	8				
Associate Degree Programs in C. C. & Technical Institutes	8	92	0	8				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 38% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1—Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 8. PATIENT CARE: ANESTHESIA AND MEDICATIONS (32 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY N	LEVEL OF RESPONSIBILITY* NR-1 %	2 %	3-4 %	PRECEPTORS N	LEVEL OF RESPONSIBILITY NR-1 %	2 %	3-4 %
Dental Assisting								
001	3	50	6	44	4	47	25	28
002	5	63	22	16	9	56	9	34
003	4	69	0	31	8	56	6	38
006	6	84	0	16	10	31	19	50
009	5	44	16	41	23	28	6	66
010	3	53	31	16	13	25	19	56
011	2	84	0	16	3	69	0	31
012	3	34	25	41	16	22	31	47
013	8	63	6	31	0**			
014	10	19	13	69	19	34	13	54
Certificate Programs in Community College	31	22	25	53	86	6	13	81
Certificate Programs in Dental Schools	18	19	9	72	19	34	13	54
ALL Programs	49	13	9	78	105	6	13	81
Dental Hygiene								
002	6	53	6	41				
005	5	81	0	19				
006	7	38	9	53				
007	5	47	3	50				
008	5	56	3	41				
014	12	19	16	66				
015	10	50	13	38				
Associate Degree Programs in C. C. & Technical Institutes	28	34	6	59				
Certificate Programs in Dental Schools	10	50	13	38				
Baccalaureate Degree Programs in Dental Schools	12	19	16	66				
ALL Programs	50	16	6	78				
Dental Laboratory Technician								
001	3	84	0	16				
005	5	94	0	6				
Associate Degree Programs in C. C. & Technical Institutes	8	81	0	19				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 25% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 9. PATIENT CARE: SURGERY AND SURGICALLY RELATED (63 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY N	LEVEL OF RESPONSIBILITY* NR-1 %	2 %	3-4 %	PRECEPTORS N	LEVEL OF RESPONSIBILITY NR-1 %	2 %	3-4 %
Dental Assisting								
001	3	79	8	13	4	48	33	19
002	5	47	51	2	9	78	3	19
003	4	69	0	31	8	76	11	13
006	6	84	10	6	10	68	16	16
009	5	13	75	13	23	21	19	60
010	3	6	86	8	13	65	21	14
011	2	89	2	10	3	95	0	5
012	3	52	35	13	16	30	38	32
013	8	89	0	11	0**			
014	10	65	10	25	19	60	13	27
Certificate Programs in Community College	31	2	75	24	86	8	17	75
Certificate Programs in Dental Schools	18	63	10	27	19	60	13	27
ALL Programs	49	0	67	33	105	8	17	75
Dental Hygiene								
002	6	90	2	8				
005	5	86	6	8				
006	7	76	5	19				
007	5	68	5	27				
008	5	73	3	24				
014	12	59	19	22				
015	10	65	11	24				
Associate Degree Programs in C. C. & Technical Institutes	28	63	5	32				
Certificate Programs in Dental Schools	10	65	11	24				
Baccalaureate Degree Programs in Dental Schools	12	59	19	22				
ALL Programs	50	48	16	37				
Dental Laboratory Technician								
001	3	100	0	0				
005	5	100	0	0				
Associate Degree Programs in C. C. & Technical Institutes	8	100	0	0				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision: (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 33% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 10. PATIENT CARE: IMPRESSIONS (17 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	18	6	76	4	0	24	76
002	5	24	29	47	9	18	0	82
003	4	18	6	76	8	41	6	53
006	6	0	24	76	10	12	29	59
009	5	0	29	71	23	12	6	82
010	3	18	47	35	13	24	12	65
011	2	76	0	24	3	76	6	18
012	3	12	0	88	16	18	0	82
013	8	12	0	88	0**			
014	10	0	0	100	19	0	6	94
Certificate Programs in Community College	31	0	6	94	86	0	0	100
Certificate Programs in Dental Schools	18	0	0	100	19	0	6	94
ALL Programs	49	0	0	100	105	0	0	100
Dental Hygiene								
002	6	76	0	24				
005	5	88	0	12				
006	7	29	12	59				
007	5	76	0	24				
008	5	12	0	88				
014	12	0	0	100				
015	10	47	12	41				
Associate Degree Programs in C. C. & Technical Institutes	28	6	6	88				
Certificate Programs in Dental Schools	10	47	12	41				
Baccalaureate Degree Programs in Dental Schools	12	0	0	100				
ALL Programs	50	0	0	100				
Dental Laboratory Technician								
001	3	47	0	53				
005	5	41	12	47				
Associate Degree Programs in C. C. & Technical Institutes	8	41	0	59				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility
%: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 24% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 11. PATIENT CARE: DENTAL LABORATORY (85 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
	N	NR-1 %	2 %	3-4 %	N	NR-1 %	2 %	3-4 %
Dental Assisting								
001	3	37	8	54	4	39	28	33
002	5	75	1	24	9	53	9	38
003	4	63	6	31	8	67	7	26
006	6	51	25	24	10	14	38	48
009	5	8	11	81	23	39	13	48
010	3	59	29	12	13	44	4	53
011	2	84	1	14	3	79	6	15
012	3	71	11	19	16	8	15	76
013	8	60	1	39	0**			
014	10	6	1	93	19	15	11	74
Certificate Programs in Community College	31	5	6	89	86	0	6	94
Certificate Programs in Dental Schools	18	2	2	95	19	15	11	74
ALL Programs	49	0	1	99	105	0	5	95
Dental Hygiene								
002	6	93	0	7				
005	5	95	2	2				
006	7	67	14	19				
007	5	89	1	9				
008	5	58	12	31				
014	12	6	1	93				
015	10	82	5	13				
Associate Degree Programs in C. C. & Technical Institutes	28	42	20	38				
Certificate Programs in Dental Schools	10	82	5	13				
Baccalaureate Degree Programs in Dental Schools	12	6	1	93				
ALL Programs	50	2	2	95				
Dental Laboratory Technician								
001	3	1	3	95				
005	5	9	0	91				
Associate Degree Programs in C. C. & Technical Institutes	8	0	2	98				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 28% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 12. PATIENT CARE: INSERTIONS AND RESTORATIONS (47 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	51	26	23	4	38	43	19
002	5	32	64	4	9	30	28	43
003	4	98	0	2	8	66	19	15
006	6	45	32	23	10	30	43	28
009	5	2	66	32	23	11	4	85
010	3	11	85	4	13	26	32	43
011	2	96	4	0	3	100	0	0
012	3	53	30	17	16	21	15	64
013	8	62	2	36	0**			
014	10	13	4	83	19	13	23	64
Certificate Programs in Community College	31	0	53	47	86	0	2	98
Certificate Programs in Dental Schools	18	9	4	87	19	13	23	64
ALL Programs	49	0	13	87	105	0	0	100
Dental Hygiene								
002	6	79	2	19				
005	5	91	4	4				
006	7	49	32	19				
007	5	72	0	28				
008	5	55	9	36				
014	12	6	6	87				
015	10	60	26	15				
Associate Degree Programs in C. C. & Technical Institutes	28	26	21	53				
Certificate Programs in Dental Schools	10	60	26	15				
Baccalaureate Degree Programs in Dental Schools	12	6	6	87				
ALL Programs	50	2	6	92				
Dental Laboratory Technician								
001	3	86	2	13				
005	5	85	0	15				
Associate Degree Programs in C. C. & Technical Institutes	8	79	2	19				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 43% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 13. PATIENT CARE: ADJUSTMENTS AND REPAIRS (33 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	64	21	15	4	42	33	24
002	5	55	36	9	9	30	33	36
003	4	85	9	6	8	79	6	15
006	6	76	9	15	10	24	48	27
009	5	6	52	42	23	6	6	88
010	3	21	70	9	13	12	30	58
011	2	97	0	3	3	96	0	3
012	3	82	3	15	16	12	24	64
013	8	67	3	30	0**			
014	10	3	12	85	19	9	39	51
Certificate Programs in Community College	31	3	39	58	86	0	3	97
Certificate Programs in Dental Schools	18	3	12	86	19	9	39	51
ALL Programs	49	0	12	88	105	0	3	97
Dental Hygiene								
002	6	89	0	12				
005	5	94	0	6				
006	7	73	18	9				
007	5	81	3	15				
008	5	64	3	33				
014	12	0	12	88				
015	10	82	6	12				
Associate Degree Programs in C. C. & Technical Institutes	28	48	9	42				
Certificate Programs in Dental Schools	10	82	6	12				
Baccalaureate Degree Programs in Dental Schools	12	0	12	88				
ALL Programs	50	0	12	88				
Dental Laboratory Technician								
001	3	51	0	49				
005	5	61	0	39				
Associate Degree Programs in C. C. & Technical Institutes	8	48	0	52				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 33% of the tasks were identified by one or more of the preceptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

TABLE H-1--Continued

LEVEL OF RESPONSIBILITY TAUGHT BY FACULTY AND PRECEPTORS BY CATEGORY OF PERFORMANCE

PART 14. PATIENT CARE: CHAIRSIDE ASSISTING AND CLINICAL SUPPORT (67 TASKS)

DENTAL AUXILIARY PROGRAMS: BY TYPE, BY RESPONDENT SITE, BY LEVEL & INSTITUTIONAL SETTING	FACULTY	LEVEL OF RESPONSIBILITY*			PRECEPTORS	LEVEL OF RESPONSIBILITY		
		NR-1	2	3-4		NR-1	2	3-4
	N	%	%	%	N	%	%	%
Dental Assisting								
001	3	3	3	94	4	7	3	90
002	5	18	21	61	9	13	1	85
003	4	18	1	81	8	10	7	82
006	6	12	6	82	10	1	4	94
009	5	3	6	91	23	3	0	97
010	3	6	16	78	13	3	4	93
011	2	42	3	55	3	25	1	73
012	3	3	6	91	16	4	0	96
013	8	9	1	90	0**			
014	10	0	0	100	19	0	0	100
Certificate Programs in Community College	31	0	1	99	86	0	1	99
Certificate Programs in Dental Schools	18	0	0	100	19	0	0	100
ALL Programs	49	0	0	100	105	0	0	100
Dental Hygiene								
002	6	39	10	51				
005	5	58	4	37				
006	7	22	4	73				
007	5	21	0	79				
008	5	13	3	84				
014	12	0	0	100				
015	10	10	15	75				
Associate Degree Programs in C. C. & Technical Institutes	28	6	0	94				
Certificate Programs in Dental Schools	10	10	15	75				
Baccalaureate Degree Programs in Dental Schools	12	0	0	100				
ALL Programs	50	0	0	100				
Dental Laboratory Technician								
001	3	79	0	21				
005	5	79	4	16				
Associate Degree Programs in C. C. & Technical Institutes	8	75	2	24				

*Level of responsibility: (NR-1) No response and not taught; (2) graduate will be able to perform, but only under direct supervision; (3-4) graduate will be able to perform with shared or independent responsibility. %: Percent of tasks within the category which were identified, by at least one respondent, as being taught to the indicated level of responsibility but not higher, e.g., in Respondent Site 001, 3% of the tasks were identified by one or more of the preteptors as being taught to the 2 level, but no preceptor identified these same tasks as being taught to the 3 or 4 level. Percents may not add to 100 due to rounding.

**Does not utilize preceptors.

APPENDIX I

LETTERS TO NONRESPONDENTS

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

BUREAU OF EDUCATIONAL RESEARCH
288 EDUCATION BUILDING
URBANA, ILLINOIS 61801
AREA CODE 217 333-~~XXXX~~ 1450

Dear

May we extend our sincere thanks to you and your faculty for the response we received to the Functional Task Analysis Questionnaire of Dental Auxiliary Education Programs. We appreciate your time and effort in making the study a success up to this point.

We are currently in the process of analyzing the responses and, in part, we are looking at the responses to which tasks are taught in your program as reported by (1) the faculty and (2) the preceptors. In considering the manner in which we can make these findings of most value to you, we would like to ask you to consider the following possible report format.

You will recall that we asked you to respond to 560 task statements. These covered several actual or potential areas of work within a dental practice. Now, what we would like to do is to place each of the tasks into one of a select group of categories in an attempt to put related tasks together in such a way that the report of tasks taught (and not taught) will be of value to you in curriculum evaluation and development. We would like to ask you to look at the attached list of suggested categories and evaluate them as to their usefulness to you as categories into which we may place the related task statements. Please be aware that we have tried to keep the list of categories short so that you do not become taxed with an unwieldy list.

We are also enclosing a list of Task Codes which are being used by the U.C.L.A. School of Dentistry's FTA Project. The list of Task Codes is too long to be of value as a group of categories, but it did provide us with the idea of grouping tasks by type of task performed rather than by types of dental practice. You will note, for example, that we used the category "Impressions" and will group together all tasks from across all areas of dental practice where impressions are made.

We would appreciate it if you would react to our proposed categories by making notes or suggestions on our proposed category list itself. Please return your reactions in the enclosed envelope.

Thank you again. We would appreciate your reactions at your eariest convenience. If you have any questions, please call me collect.

Sincerely,

David R. Terry
Project Director

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

BUREAU OF EDUCATIONAL RESEARCH
288 EDUCATION BUILDING
URBANA, ILLINOIS 61801
AREA CODE 217 333-xxxx 1450

Dear

Thank you for taking the time and effort to complete the Dental Auxiliaries Education Study questionnaire. We appreciate the time that you must have given up from doing other more enjoyable things in life.

In reviewing your responses, we note that you inadvertantly missed the enclosed pages. Would you please take a few minutes and complete these few questions so that your booklet is complete. A self-addressed, stamped envelope is also enclosed for your convenience in returning the pages.

Thanks again.

Sincerely,

David R. Terry
Project Director

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

BUREAU OF EDUCATIONAL RESEARCH
288 EDUCATION BUILDING
URBANA, ILLINOIS 61801
AREA CODE 217 333-~~XXXX~~ 1450

Dear

May I take this opportunity to bring you up to date on the progress of the Functional Task Analysis Study being conducted in connection with the Dental Assisting Program in which you are serving as a member of the faculty. We have had a one hundred percent response from the faculty of nearly every program in the State. We are, however, missing your response. May we encourage you to complete your Task Inventory Booklet in order that we may have a one hundred percent response for your school's program.

We appreciate the value of your time and we feel that we can assure that your time will be well spent, particularly since we will be providing a feedback evaluation report of the Dental Assisting Program. May we again sincerely solicit your cooperation in this study.

Thank you for your courtesy and time.

Sincerely,

David R. Terry
Project Director

DRT:sl

UNIVERSITY OF ILLINOIS AT URBANA-CHAMPAIGN

BUREAU OF EDUCATIONAL RESEARCH
288 EDUCATION BUILDING
URBANA, ILLINOIS 61801
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We appreciate the value of your time and we feel that we can assure that your time will be well spent, particularly since we will be providing a feedback evaluation report of the Dental Assisting Program. May we again sincerely solicit your cooperation in this study.

I have enclosed another questionnaire for your convenience in case you have misplaced the first one. If you are too pressed for time, please respond to at least the task question dealing with "level of responsibility" and let the "time" question go.

Thank you for your courtesy and time.

Sincerely,

David R. Terry
Project Director

DRT:sl